

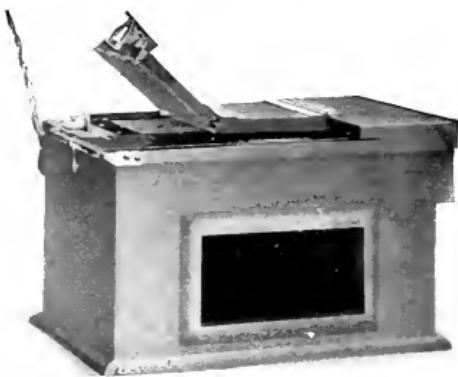
KODAKERY

A
MAGAZINE *for* AMATEUR
PHOTOGRAPHERS



NOVEMBER 1918

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TORONTO, CANADA.



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SPIRES OF CHARTRES CATHEDRAL.
Made with a Prema; Film Pack Film



PUBLISHED MONTHLY—YEARLY SUBSCRIPTION, 50 CENTS; SINGLE COPIES, 5 CENTS.

VOL. VI.

NOVEMBER, 1918

No. 1



RIVER HOUSES IN CHARTRES
Made with a Premo; Film Pack Film

AN OLD FRENCH TOWN

BY ALBERT CRANE WALLACE

THE war has ravaged so much fair land that we turn with special gratification to the spots of unhurt beauty. Happily, most of France is still unspoiled, and it is a delight to look in upon

a quaint town such as Chartres. Chartres, lying southeast of Paris—on the side opposite the menacing hordes—is capital of the Department of Eure et Loir, with little river Eure winding past its



CHARTRES CATHEDRAL FROM THE RIVER

Made with a Premo; Film Pack Film

curious old houses and under its stone bridges, seared by time, and recalling centuries of tradition.

The fact that Chartres was taken from the English as long ago as 1432, reminds us of its age and of the vastly different national conditions prevailing at the time when this conquest was accomplished. Northern France, like Belgium, has been the scene of much picturesque and dreadful warfare.

Yet, the Chartres that survives does not aggressively remind the visitor of tragedies of the past. The struggles of the present are reflected, as they must be reflected, in every hamlet of war-stricken Europe. But the charm of the venerable place makes a potent appeal, perhaps, especially to a visi-

tor from a newer land, a land such as our own, which had not been discovered at a time when Chartres was already old.

Of commanding interest in the old town is the noble cathedral, one of the most famous in the world. How nobly it rises in the midst of the clustered roofs, like some spirit of aspiration pointing to the zenith, is exquisitely suggested in some of the photographs which accompany this article. We look with the more delight at these graceful spires when we pause for a moment to think of the sad wreckage of certain others, of ruin where there can be no real restoration or atonement.

It is, indeed, as a subject for photography that we may look



A RIVER VISTA

Made with a Premo; Film Pan F (n)



INTERIOR OF ST. PETER'S CHURCH, CHARTRES

*Made with a Premo; Film Pack Film
stop 8; 2 minutes' exposure*

with genuine interest at an old place like Chartres. Making pictures in such a place is like photographing history. Every negative will seem to remind us of the vanished figures of knights and ladies in Norman splendor of raiment. We may fancy horses in glittering trappings, and the silk and velvet and plumes of mediæval times—we may go back to Joan of Arc's day, and to later days of bright colored life that underwent a great change when the Bastile fell.

Streets and riverside are rich in pictorial suggestions. With trusty camera and sunlight in such a

scene we have but to do the artist's part of choosing the point of view.

After all, that phrase "point of view" has a wonderful double meaning. If it is point of view that gives us the beauty of the picture, it is point of view also that finds in the historic significance of a place like Chartres, so many and such varying impressions. I am thinking particularly of the picture point in the parallel. Point of view in all matters of judgment is important, because facts stand out differently from different angles. It is the same with picture facts. We can emphasize almost any fact before us by the position we take in making our picture. We can make a cathedral, for example, look incidental or com-

manding by the choice of a situation from which to view it. We can make the river look incidental or important in the same way. And sheer beauty of line, whatever the subject, is always at the finger end of the person who holds the camera. Here we find one of the pleasant and profitable allurements of the Kodak.



Keep your lens clean. A dirty lens invariably means flat, muddy-looking pictures.



THE CASTLE GATE, CHARTRES

Made with a Premo, Film Pack Film.



FIG. 1

WORKING AGAINST THE LIGHT

In making snapshots we ordinarily photograph the side of our subject on which the strongest light falls (or, as may be wiser, choose a pleasing three-quarter, if not a cross light), but it sometimes happens that the most pleasing lighting effects can be obtained by picturing the shadow side of subjects that are in bright sunshine.

In order to photograph the shaded side of a subject we naturally point the lens either directly or obliquely toward the source of light, and when this is done on a cloudless day we must, of course, avoid letting the direct light of the sun strike the surface of the lens, for the sunlight that makes the

picture on the film will also fog the film and spoil the picture if the sun's rays shine directly in the lens while the exposure is being made.

This does not mean that it is difficult to make pictures by pointing the lens directly toward the east when the sun is in the east, or toward the south or west when the sun is in the south or west, but it does mean that when the lens is pointed toward the direction from which the bright sunshine comes we must make sure that it is in the shadow of some object that is outside its field of view, or is by some other means shaded during the exposure.

We can frequently secure the picture we want from a point of



Fig. 2

view where the shadow of a tree or a building will fall on the lens, and when no such shadow is available we can always create one by holding a hat or some other object in such a position that it will cast a shadow on the lens. In shading

the lens we should make sure that the object that casts the shadow cannot be seen in the finder, so that it will not be shown in the picture.

Our illustrations show four typical against-the-light pictures. To



FIG. 3

make clear how pictures with similar lightings can be obtained we will discuss them separately:

We can often observe such a lighting effect as is shown in Fig. 1 when the overhead sky is obscured by dark clouds while the horizon is brightly illuminated. This kind of lighting is more apt to be seen in the early morning and late afternoon than during other hours of the day and it offers splendid opportunities for making outdoor

silhouettes by photographing subjects with the strong horizon-light for a background. As the sun is always hidden by the clouds when this kind of a lighting occurs the lens need not be shaded when the exposure is being made.

The shadow on the ground in Fig. 2 tells us that the picture was made when the sun was high in the heavens, slightly to the left and slightly behind the group. It is



FIG. 4

this side and back lighting that put the important details—the lights and shadows on the folds of the dancers' gowns—into the picture. Had the sun been in front instead of behind the group it would have shone directly into, instead of *across* these folds, and the delicate shadows, which add so much to the rendering of the costumes, would have been on the other side of the group, where they could not be seen from the position of the camera.

The unique lighting effect shown in Fig. 3 can be observed on any sunny day. The shadows on the

ground show the direction from which the sunlight came, and the dark tone of the sky suggests that the picture was made through a color filter on a summer's day when the sky was a deep blue. In many parts of the world the sky is a *deep blue*, in summer, for only a few hours when the temperature has dropped after a rain.

Beautiful pictures of the type of Fig. 4 can be made on every large body of water when the sun is near the horizon and is partly hidden by clouds. Since it is impossible to keep the sunlight out of the lens when the sun is to be

included in the picture we must make the exposure for such subjects at times when it is hazy or

cloudy enough so that only the sun's position—not the sun itself—can be distinctly seen.



REYNARD SITS FOR HIS PORTRAIT

BY HOWARD TAYLOR MIDDLETON

Illustrated with a flashlight picture by the Author

In the Autumn, when the frost sends the dead leaves swirling down in a multi-colored shower, and the deer season is in full swing in the New Jersey pines, the hunter on a stand in the early morning, waiting patiently for the big buck that may come his way, sees a flitting gray shape loping easily along the woodland road within easy range. He raises his gun, then, remembering that he is after bigger game, and that a shot may spoil his chances, lowers it again with an imprecation. Thus does Reynard of the barrens laugh at man; he is a very cunning rascal and knows perfectly well when he is safe.

If the camera man would outwit Reynard, he must locate a den and either stalk the parents as they leave or return to their young, or else set up a baited camera at night, or "shine" them while at the bait with a jack-light.

The gray fox photograph accompanying this article was obtained by the jack-light method in the following manner: A cotton-tail, shot at close range, and, therefore, too badly mangled even for a stew, was laid at the foot of a slender pine near a den in

which there were two young foxes. To make sure that the parents would get the scent, the rabbit was dragged from the tree to the entrance of the den and back again.

The Premo camera was set up and focused on the bait, the Eastman Flash Pistol fastened to a stake beside the camera and the thread that was tied to the trigger of the pistol was brought to our hiding place ten yards away.

As soon as it was dark we crawled into ambush and, at every rustling in the leaves, flashed the rays of our electric lantern on the scene of our hoped for triumph. After what seemed many hours, but which in reality was rather less than fifty minutes, one of the old foxes came to the bait.

I shall never forget the thrill that ran through me when those two balls of fire (the eyes of the fox) flamed in the rays of the jack-light, nor how my hand trembled as it pulled the thread that fired the flash. As the great beam of radiance swept skyward, for a fraction of a second the figure of Reynard stood out against the inky blackness of the night like a statue carved in marble—then all was gloom again.



GRAY FOX DEVOURING RABBIT

*Flashlight taken with Eastman Spreader Flash Cartridge Pistol,
by H. T. Middleton*



SERBIAN OFFICERS IN SNOW-TIME
Made with 3A Folding Pocket Kodak, by Merle LaVoy

THE DATE ON THE FILM

WASTE no opportunities. When you make pictures be sure that your film is fresh. If you make a bad print you can throw it away and make another. When you make a bad negative you may have wasted an opportunity that will never come again. Take no unnecessary chances. As a safeguard to photographers, an "expiration date" is put on all Eastman Films, and no film should be put to important use after such a date. Because films which have been kept under proper conditions are often good long after the expiration date, some people get careless about this matter of fresh film and sooner or later disappointment follows.

Remember, too, that film will deteriorate between the time of exposure and the time of develop-

ment even more rapidly than before exposure, owing to the fact that in the process of passing through the camera it is exposed to air and moisture as well as to the light that comes through the lens at the instant of exposure. In hot, damp climates, especially, it will take up moisture very rapidly and then there's only one safe thing to do—develop promptly. It does no good to wrap it up or put it away in a tin box, for the moisture is now in the film and the box acts like a fireless cooker in retaining the moisture.

Before development, whether exposed or unexposed, the film should be kept in a cool, dry place.

Always be sure films are fresh when you purchase them, and develop them or have them developed as promptly as possible after exposure.



BRITISH OFFICER WITH A GERMAN "PROPAGANDA" BALLOON WHICH FELL IN THE BRITISH LINES.

The Germans used to drop leaflets printed in French over the British lines.
British Pictorial Service

KODAK

TOLD FROM DECK
AND BEACH



SEA STORIES





AN ALPINE VILLAGE

Made with 3.4 Folding Pocket Kodak

THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES

CHAPTER VI—THE DEVELOPING SOLUTION

In the last chapter we saw that the chemical process of development consists of the removal of the bromine from the silver bromide in the emulsion so as to leave the grains of silver behind.

There are many chemicals which will remove bromine from silver bromide in this way, but in order to act as a developer, it is necessary that a chemical should be chosen which has the power of turning the exposed silver bromide into metallic silver, but which will not act on unexposed silver bromide, since, if the developer acted on the unexposed, as well as on the exposed grains, we should not get an image at all, but the whole film would go dark when put in the

developer, just as if it had all been fogged by exposure to light. Only a very limited number of chemicals have this power of distinguishing between exposed and unexposed grains of silver bromide and, consequently, there are only a few substances which are suitable for use as developers.

The chief of these developing substances are pyrogallol, or "pyro" as the photographer calls it, hydroquinone and elon, all of which are chemically related to aniline, which is used as the base of coal tar dyes. Hydroquinone and elon, indeed, are made by the same methods as those used for making dyes, but pyro is made more easily by distilling gallie acid, which is produced



THE BROOK
Made with No. 2 Brownie

by fermenting gall nuts, so that, although pyro is really a cousin of hydroquinone, it is made quite differently, from a vegetable product, while hydroquinone itself is made from aniline.

Now, if we take a solution of one of these chemicals, let us say pyro, and put an exposed film into it, we shall get no development at all; the developing agent by itself having no power to develop. In order to make it develop we must add a little alkali to the solution. Any kind of alkali will make it develop, but the most convenient one to use is carbonate of soda which, in its crude form, is called sal-soda and is used to make water alkaline for washing. If, then, we take a solution of pyro and add some sodium carbonate to it, it will develop our exposed films;

but a solution containing only pyro, carbonate and water will not keep and, if we leave it in the air, it will very soon go dark and lose its developing power.

In order to make it keep, there is added to the developer some sulphite of soda because the developer is spoiled by taking up oxygen, and sulphite is so greedy of oxygen that it will take it away from the oxidized pyro or take it in preference to the pyro, and thus protects the pyro from the oxidizing action of the air and enables it to keep its developing power, although the sulphite itself has no developing power at all.

The essential constituents of a developer therefore are: The developing agent — pyro or hydroquinone or elon, or Kodelon which is a relative of elon — the alkali,



THE REAPER
Made with No. 2 Brownie

which is generally carbonate of soda, and the preservative, which is sulphite of soda. Very often a developer which contains only these constituents will prove difficult to handle. It will tend to give fog, that is, to develop unexposed silver bromide as well as exposed silver bromide, and so, in order to regulate it, there is put in a little potassium bromide to act as a restrainer.

The different developing agents behave somewhat differently. Suppose, for instance, that we make up two developers, one with hydroquinone and the other with elon, and start to develop a film in each at the same time. In the elon developer the image will appear very quickly on the film and will appear all over the film at the same time, the less exposed portions which, of course, were the shadows in the picture, appearing at the

same time as the highlights. On the other hand, with the hydroquinone the image will appear more slowly, and the most exposed portions, or the highlights, will appear first, so that by the time the shadows have appeared on the surface of the film the highlights will have acquired considerable density. If development is stopped as soon as the whole image is out, then the negative developed in elon will be very thin and gray all over, while that developed in hydroquinone will have a good deal of density in the highlights. Thus, of these two developers we may say that elon gives detail first and then slowly builds up density, while with hydroquinone the detail comes only after considerable density has been acquired. It is for this reason that these two developing agents are used in combination; the hydroquinone gives the



WOUNDED BUT CHEERFUL.

*A British Official Picture from the British Pictorial Service
Taken on the Western Front*

density and the elon the detail, and together they make a well balanced developer.

These differences in the behavior of developing agents are due to a property of the developer which can be explained very easily by an analogy. Suppose that we had two automobiles of the same kind, one of 20 horsepower and the other of 100 horsepower. What would be the difference between them? Naturally, the high horsepower automobile would be able to go faster than the other; but in a city, at any rate, either of them would be able to go as fast as was safe, and no one would wish to use the higher horsepower for increased speed; but the advantage of the high horsepower would be found whenever the automobiles were used against adverse circumstances, as, for instance, against high winds, in snow, or in climbing hills, when the high-

power machine would be able to keep up its speed against the difficulties, and the lower power machine would be slowed and might even be unable to get ahead. The difficulties which affect development in a manner corresponding to the effect of hills or winds for an automobile are cold and bromide. The addition of bromide has the same effect on a developer that a hill has on an automobile—it slows it down; but bromide has far more effect on a low power developer like hydroquinone than it has on a high power developer like elon; the effect of bromide on elon is very small, while on hydroquinone it is very great. In the same way, hydroquinone develops very slowly when it is cold, while elon is not nearly so much affected by temperature.

The analogy between the horsepower of the automobile and the power of the developer is really very close. The high horsepower automobile will start from rest very much more quickly than the machine of lower horsepower, just as the elon developer forces out the image all over the film much more rapidly than the hydroquinone developer. Just as the horsepower of an automobile could be measured by the effect of a hill on its speed so the power of a developer can be measured by the reduction of density produced by the addition of bromide, and just as one would not wish to have an over-powered automobile, hard



OUT-DOOR WORK
Made with No. 1 Brownie



THE LETTER BOX

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to handle and always picking up speed very rapidly, so it is difficult to use the very high power developers, and elon, for instance, is rarely used alone, but is generally adjusted by a mixture with the slower hydroquinone.

Pyro is an almost ideal developer for negative making, but owing to the fact that the pyro is changed during development into a yellow colored substance, some of which

remains with the silver in the image, pyro tends to give a slightly yellowish or brownish image. The yellowish stain is prevented from forming by sulphite, so that the more sulphite there is in a developer the less tendency to warmth the deposit will show, but, nevertheless, pyro is not used for papers for which the blue-black image obtained with elon and hydroquinone is preferred.



THE RISING MOON

From a photograph by J. S. Gordon, in which the path of the moon is shown by the white streak in the sky

KODAK SERVICE

In the first number of KODAKERY, which was published five years ago, we invited all amateur photographers who wished assistance in their photographic work to send us negatives and prints for criticism.

This invitation was instantly accepted and it soon became evident that our readers were profiting more from our criticisms and from the suggestions we offered for the improvement of their future work than they could have profited from criticisms of pictures which they had not made themselves.

We wish to help all amateurs in solving such photographic problems as may confront them, and in order to render the best possible service we invite all who care for our assistance to send us prints and the negatives from which they were made, together with all the data possible.

What we would like to know is the month, the time of day, the stop used and the exposure given when the negatives were made, and also the name and grade of paper on which the prints were made.

By examining the negatives we can tell whether exposure and development were correct, and by comparing the prints with the negatives we can tell whether the trouble, if any, lies in the printing or in the making of the negatives. Both negatives and prints will be promptly returned.

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"Your very cordial letter of the 24th is in hand. I thank you for it and your concern in helping me to obtain the desirable results in my attempt at photography."

"You have helped me out of my troubles before and I am sure you always will, so I am sending you some questions I wish you to answer."

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These Frames are offered for the leading sizes of amateur pictures, namely, $2\frac{1}{4} \times 3\frac{1}{4}$, $2\frac{1}{2} \times 4\frac{1}{4}$, $3\frac{1}{4} \times 4\frac{1}{4}$, $2\frac{7}{8} \times 4\frac{7}{8}$, $3\frac{1}{4} \times 5\frac{1}{2}$ and $3\frac{1}{2} \times 5\frac{1}{2}$ (postcards). The openings in the Frames are of the full dimensions stated.



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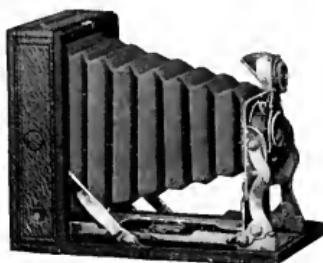
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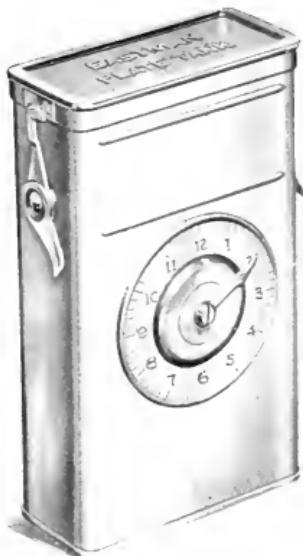
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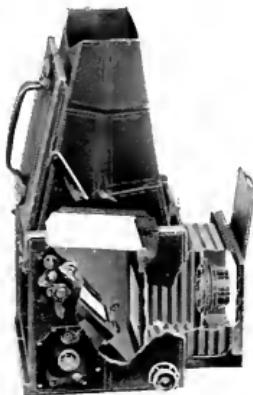
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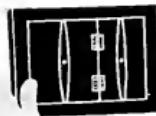
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For 100 negatives, $2\frac{1}{2}$ x $4\frac{1}{4}$, or smaller	\$1.00
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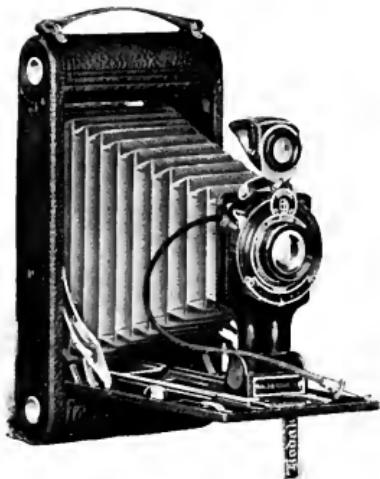
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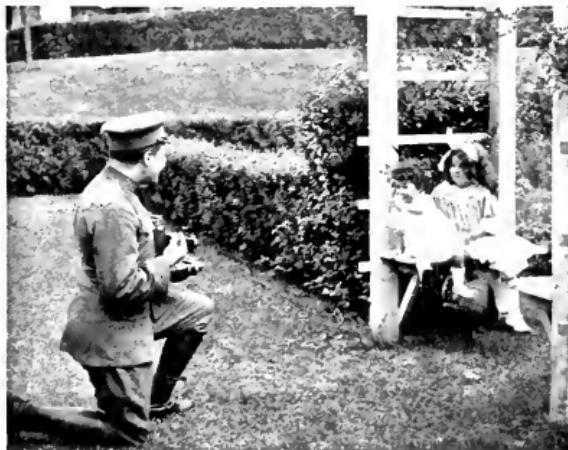
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KODAKERY

A
MAGAZINE *for* AMATEUR
PHOTOGRAPHERS



DECEMBER 1918

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TORONTO, CANADA.

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OBSERVATION BALLOON PREPARING FOR ASCENT
British Pictorial Service



PUBLISHED MONTHLY—YEARLY SUBSCRIPTION, 50 CENTS; SINGLE COPIES, 5 CENTS.

VOL. VI.

DECEMBER, 1918

No. 2



BALLOON OBSERVER ADJUSTING PARACHUTE TACKLE

THE EYES OF THE ARMIES

BY ALBERT CRANE WALLACE

Illustrated with British Official Photographs from British Pictorial Service

THE prolongation of the war, it is frequently said, has been due very largely to the fact that the element of surprise has been so greatly removed. The ex-

planation of this removal of surprise is found in the "eyes" in the air.

Airmen never can be wholly deceived, no matter how far camouflage may be carried. And human



PILOT AND OBSERVER WITH THEIR MASCOT PUP



THE FLIGHT

always solely occupied by observation is forcibly suggested by a monster bombing plane seen on page 4. The tremendous size of these engines of death is vividly brought out by a comparison of wings and adjacent figures, or by the seated figure of the alert pilot. The great weight of bombs carried by these gigantic planes is sufficient explanation of their size and ruggedness as compared with the one-man Spads, for example.

Certainly there is something picturesque in the glimpse of the soldier on the Turkish observation post. The expedient is a reminder of the many efforts, in tree tops and otherwise, made to give eyes to the armies.



BRITISH SOLDIER CLIMBING A TURKISH OBSERVATION POST



ARRANGING A BACKGROUND FOR A VASE OF FLOWERS

BACKGROUNDS FOR SMALL OBJECTS

IN photographing cut flowers, potted plants, bric-a-brac and other small objects the most pleasing effects are obtained when nothing but the object of interest is conspicuous enough within the picture area to attract attention.

The simplest and most effective way to make any object conspicuous, and all else in the picture inconspicuous, is to photograph it against a plain background.

The background may consist of a sheet of cloth or paper that has no design or pattern of any kind and is neither creased nor wrinkled. Whatever color of ground is used it will photograph either white or

gray or black, and we should always select a ground that will photograph either lighter or darker than the subject. We cannot outline white against white, nor black against black, but we can outline both white and black against gray.

Many kinds of plain cloths make suitable backgrounds, and the common tan-colored wrapping paper that is found in nearly all stores, in rolls of different widths, is especially desirable, because it is free from wrinkles and it photographs gray, which is a suitable background color for flowers and for nearly all other small objects.

The easiest and one of the best

ways to photograph small objects is shown by the illustration on page 8. A common kitchen table is usually long enough for holding camera, subject and background, when a Kodak Portrait Attachment is used. This attachment enables us to work close to the subject and it gives us, in consequence, a larger image of the object than could otherwise be secured with a compact folding hand or pocket camera.

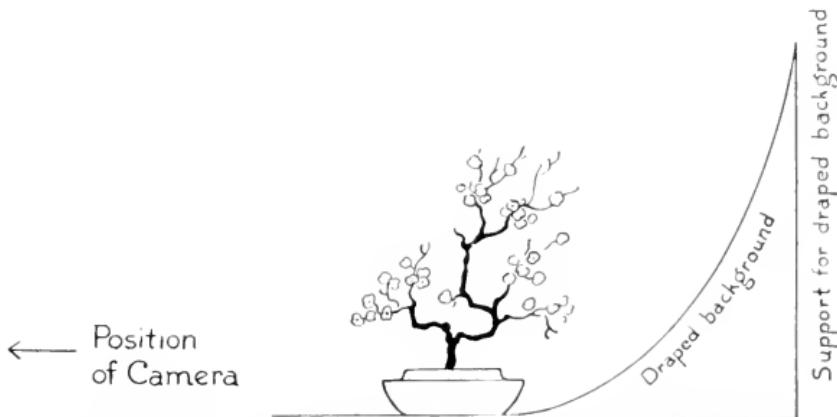
A wooden box, or almost anything else that is high enough and wide enough, will serve as a support for the background. Whatever the support may be it must have a top edge that is straight so the background will hang without folds or creases, for these would be apt to show in the print.

The picture on page 10 shows the result of working according to the method illustrated on page 8. Within its area are included, not only the background behind the flowers, but also a part of the table top in front of the flowers. Since a

ground that photographed black was used and the table top photographed dark, the line of separation between the background and the table is scarcely noticeable in the picture, but had a ground that photographs white or light gray been used the line would have shown quite plainly.

When it is desirable to have the ground, both behind and in front of the subject, of practically the same tone, the background must extend far enough along the table top in front of the subject that the table cannot be seen in the finder, and it must hang in a curve from its support, as shown in the diagram below.

The lighting should suit the subject, and the only way to see the lighting as the lens sees it is to examine it from the position the lens occupies. In the picture on page 8 we see it from the side of the table that faces the window through which the light came, and from this position the lighting looks very different than it does in the



Profile Diagram of Method of Arranging Background. Curve in background smoothly draped background.



SHOWING RESULT OF ARRANGEMENT PICTURED ON PAGE 8

picture above, which shows the lighting as the lens saw it.

A straight side lighting may be used for daisies and other flat or disk-shaped flowers, but for roses, lilies, geraniums and most other flowers, and also for all other objects that are not flat, the best rendering will usually be obtained when the strongest light shines downward at an angle of about 45 degrees on both the front and side of the subject.

Stop 16 on rectilinear and anastigmat lenses, and the second stop on fixed focus cameras is recommended for photographing objects at short range.

It is impossible to tell the exact exposure to give, for this will depend on the strength of the light that reaches the subject. When the subject is from 4 to 6 feet from a window through which the sun does *not* shine, we would suggest a $\frac{1}{2}$ to 1 second exposure.



THE FISHERMAN

*A Charming Example of Decorative Japanese Photography—Made by
S. Honjo, of Kyoto, Japan, with a 3.1 Special Kodak*



CONFIDENT AFFECTION
Made with a Folding Pocket Kodak

FIXING, WASHING AND STORING NEGATIVES

A NEGATIVE consists of metallic silver and gelatine supported on a sheet of film or glass. All these substances are extremely stable and there is no reason why a negative that was thoroughly fixed and thoroughly washed should undergo any appreciable changes if it is kept under favorable conditions.

The causes that are known to produce changes in negatives are insufficient fixing, insufficient washing and the absorption of injurious chemicals through prolonged contact with, for instance, common wrapping paper, newspaper or other kinds of paper that are not

made especially for photographic purposes.

Since thorough fixing, thorough washing and storing negatives in a suitable container are the three things needed for preserving them, we will discuss these in detail.

When a creamy color (the emulsion containing silver bromide) is seen in a negative it indicates insufficient fixing. If this is discovered *before the negative has been exposed to strong white light* it can be removed, so it will leave no stain, by immediately placing the negative in a fresh acid fixing bath and leaving it there for half an hour, after which it must be thor-

oughly washed and dried. If the creamy color is not discovered until after the negative has been exposed to strong white light it probably cannot be removed without leaving a stain.

When a negative is removed from the fixing bath too soon after the creamy color has disappeared it will also be insufficiently fixed and will change to a rusty brown after a time. This brown stain cannot be removed without injuring the negative.

In the fixing process the hypo first dissolves the undeveloped silver bromide. As soon as this has occurred the creamy color has disappeared and the negative is clear, but it is not as yet thoroughly fixed. It still contains an invisible double salt which is insoluble in water and, consequently, cannot be removed by any amount of washing. This double salt is, however, soluble in

hypo and if the negative is left in the hypo long enough the salt will be wholly dissolved.

Many photographers leave their negatives in the fixing bath twice the length of time it takes to clear them. Experience has proven this custom a wise and safe one, for it insures the removal of the double salt, providing the fixing bath has not become exhausted by the time the negatives are cleared.

The writer once fixed negatives in a bath that had been so weakened by prolonged use that it took 30 minutes for the negatives to clear. The negatives were left in the bath for 60 minutes. Some of them were then fixed again in a fresh bath while the others were not.

After all the negatives had been washed and dried they were labeled and laid aside for observation. Those that were fixed in both



A SWISS SKYLINE
Made with 3A Folding Kodak

the old and the fresh baths are still in perfect condition, but those that were only fixed in the old bath have become discolored.

A fixing bath that will not clear negatives in less than 15 minutes should be discarded, and a fresh bath used. Hypo is cheap.

When a deposit resembling a white powder forms on negatives some time after they were made it is evident that the negatives were not thoroughly washed. This deposit consists of the dried chemicals of which the fixing bath was composed. If discovered and removed by thorough washing very soon after the deposit first appears the negatives may be uninjured, but if left on the negatives for a long time, especially during the months when the air is damp, the silver is apt to be bleached and the negatives ruined.

After fixing, negatives should always be washed from 40 to 60 minutes in running water, which is constantly passing over both sides of each negative, or in from 10 to 12 changes of water, at intervals of 5 minutes, if they are washed in a tray.

Negatives should never be filed

away between the leaves of a book. Book paper usually contains chemicals that will injure a negative, and ink from a printed page sometimes becomes indelibly impressed on negatives.

Glass negatives can safely be stored, face to face and back to back, without any paper between them, in the box in which the plates were packed. The face of a glass-plate negative should not be placed in contact with the back of another negative, unless the back (glass side) of the other is perfectly clean, because, when gelatine comes in contact with finger marks it absorbs them and finger marks on a negative usually show in the print.

The best way to store film negatives is to place them in an Eastman Film Negative Album, which contains 100 numbered and indexed compartments made of a special kind of translucent paper that is free from all impurities that would injure a negative.

Thorough fixing, thorough washing and observance of the precautions we have mentioned in the storing of negatives will protect them so they should remain in perfect condition indefinitely.



Made with a
Graflex



TIVOLI CASTLE, NEAR ROME

Made with a Folding Pocket Kodak

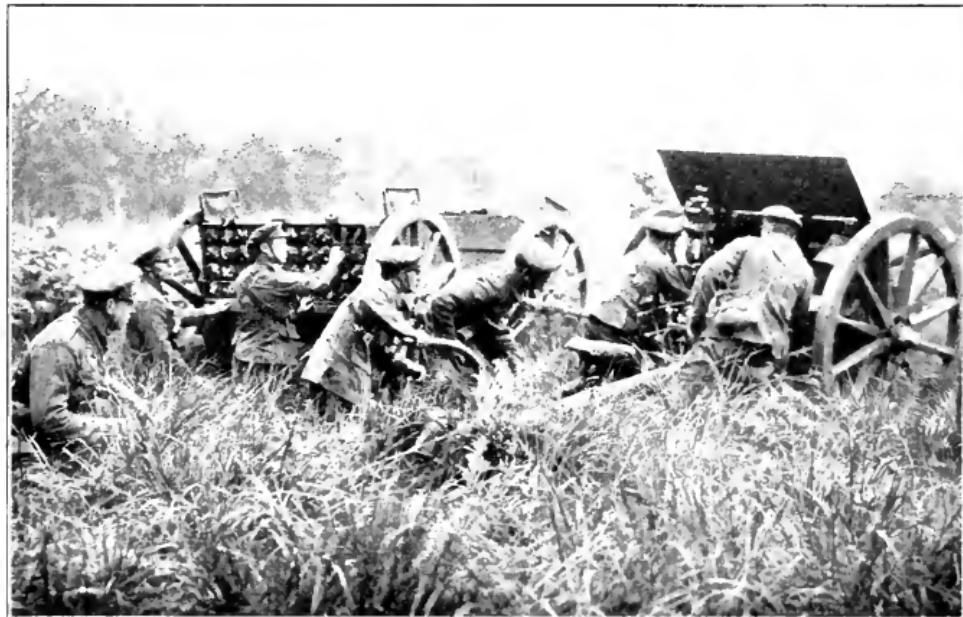
INCLUDE YOURSELF IN THE PICTURE

PLACE your camera on a tripod, with a Kodak Self Timer attached to the cable release, then set the timer so it will oper-

ate the shutter in from 30 to 45 seconds, and you will have plenty of time for taking your position in the group.



British Pictorial Service



Made with a 3A Kodak, by Merle LaVoy

GUNS

FROM WAR FRONT
NEGATIVES BY
MERLE LAVOY AND
BRITISH OFFICIAL
PHOTOGRAPHERS



Copyright by Merle LaVoy



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British Pictorial Service

THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES.

CHAPTER VII—THE RATE AT WHICH THE IMAGE GROWS DURING DEVELOPMENT

WHEN a film is developed, it is only the grains of silver bromide which have been changed by the action of light that are affected by the developer. The grains that have not been changed are not affected; at the beginning of development there are a great many exposed grains ready to be developed, and then as development proceeds, these exposed grains are turned into grains of black silver, so that the number of developable grains decreases during development until at last there are no developable grains left; all those which can be developed have been acted upon, and development ceases.

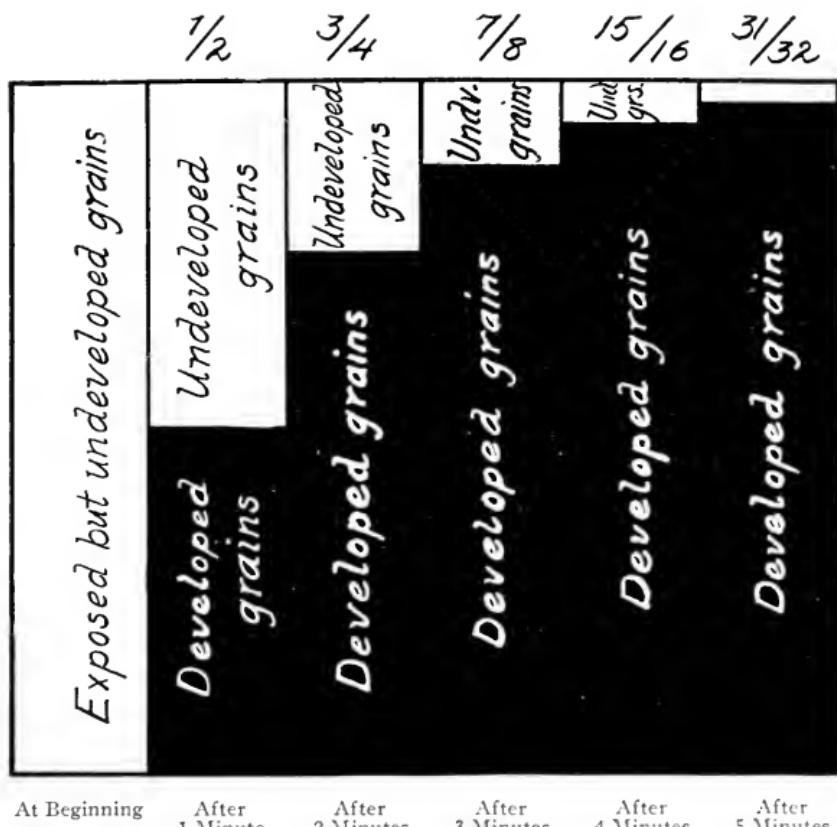
The rate at which the development proceeds can best be understood by an analogy from fishing. Suppose one went out fishing and found a pond where nobody had ever fished and there were about four hundred fish in the pond. Now, in the first day's fishing one might catch half the fish in the pond, or two hundred fish, but the second day one would not expect to catch the other half; all one could expect to catch would be the same proportion of the remaining fish, that is, half of what were left, or one hundred fish, and the third day one might catch half of what were left again, or fifty fish, and the fourth day half of what were left again, or twenty-five fish, and so on, the catch growing smaller as the number left decreased, until finally

no fish were left to catch, or more probably until one got tired of trying to get the few remaining fish.

This is what happens in development. The rate at which the grains develop depends upon the number of undeveloped grains left, and as the grains are developed up and the number of undeveloped grains remaining become less, fewer and fewer grains develop in each minute, until finally, it is not worth while to prolong the development in order to get any more density. (See Fig. 1.)

If the development is prolonged beyond the point at which all the exposed grains are developed, then there is a danger of developing some of the unexposed grains, which produces a veil over the whole picture—exposed and unexposed portions alike—and this veil is known as fog.

The growth of the image during development is referred to as a growth of density, that is to say, the density is a measure of the number of grains of silver which are produced at any given point because these grains of silver, after the film has been cleared by the fixing bath, obstruct the passage of light through the film. The density of an image is measured in units which are based on the amount of silver which will let through $1/10$ th of the light, so that if only $1/10$ th of the light falling on the negative gets through a certain part of it,



At Beginning After After After After After After
 1 Minute 2 Minutes 3 Minutes 4 Minutes 5 Minutes

Development of the exposed grains in a film which is half developed in one minute. It must not be supposed that films always develop half their grains in one minute. The proportion of grains that are developed in a minute depends on the strength and the temperature of the developer, and in the example shown, these have been adjusted specially to produce half development in one minute, an unusually rapid rate of development.

FIG. 1

that portion of the negative is said to have a density of 1. The blackest part of a negative may have a density of perhaps 2, the middle tones 1 or less, and the shadows, perhaps 1/10th. (Fig. 2).

Now, the difference of density between the darkest portion and the lightest portion of the negative is called its *contrast*. In most negatives the shadows are nearly clear

so that the contrast depends chiefly on the density of the darkest portion, but this is not necessarily so because an over-exposed negative, or one taken of a very flat subject, may have no clear portion in it and may be even very dense owing to over-exposure, and yet not contrasty at all because there is very little difference between the density of the most exposed portion and

that of the least exposed portion, the negative being very dense all over. It is necessary to keep clearly in mind this difference between the density and the contrast.

Since the *contrast* depends chiefly upon the *density of the highlights*, it grows during development just as the density does. It grows rapidly

emulsions, such as the film emulsion, give moderate contrast, but the slow emulsions, such as those

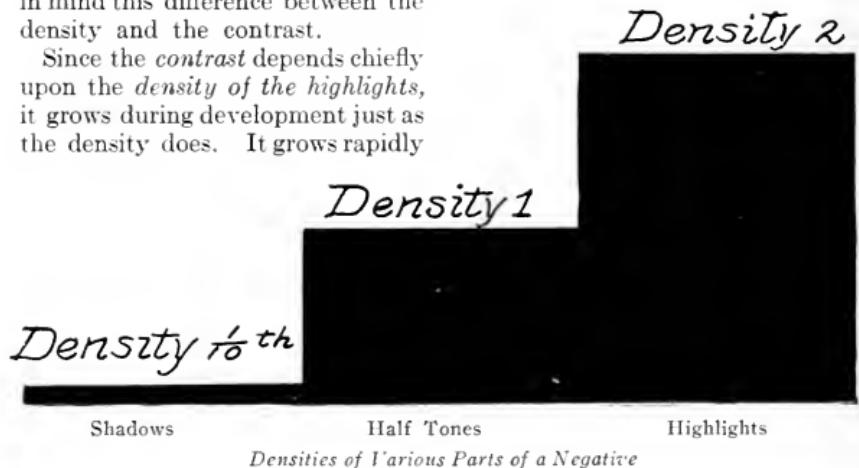


FIG. 2

at first, when there are many grains to be developed, and then more slowly until, finally, when the grains are all developed, the negative will not give any more contrast however long development may be prolonged, and a continuation of development will only result in the production of fog. (Fig. 3). The final contrast which can be obtained depends upon the kind of emulsion used. The fast

used for copying purposes or for making lantern slides, are specially made to give great contrast when development is prolonged. (Fig. 4.). It is important not to stop development early when a negative is over-exposed, even though the negative appears to be dense, because the contrast depends on the time of development, and if an over-exposed negative is under-developed, it will be flat.

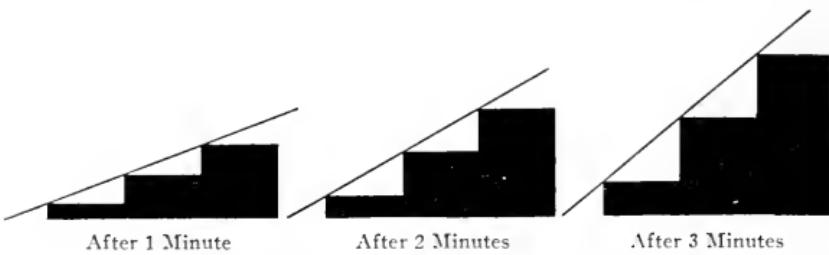


FIG. 3



Greater Contrasts given by Different Kinds of Emulsions

FIG. 4

FOR THE SOLDIERS' CHRISTMAS

THE pictures that warm the heart of a soldier, that daily remind him of his home and all that he is fighting for are Kodak prints of the home folks and the familiar home scenes.



A HAYING STORY
Made with an O Brownie



THE CLOUDS

Made by H. R. Merrill, with 3A Folding Kodak. Season, September; hour, 2.30 P.M. Stop 4; 1.25 sec., no filter.

CLOUDY DAY CLOUDS

VERY few of us who live in cities or villages pay any particular attention to the sky, and when we want to make a picture of a landscape that will show clouds above it we are apt to wait for a sunny day when white clouds can be seen.

By watching the sky we will discover, however, that the finest cloud formations do not always occur on sunny days, and that the clouds often show a longer range of tones on days when there is no sunshine.

Sunny day clouds are frequently mere masses of white that contain few if any dark tones, and when these fleecy-looking masses are outlined against a brightly lighted pale blue sky it is more difficult to obtain good photographic records

of them, when landscape detail is also wanted, than it is to obtain good photographic records of the light, medium and dark gray clouds that can so often be seen outlined against layers of much brighter clouds, on cloudy days when the weather is unsettled.

In picturing clouds and landscape on sunny days our problem is the recording of contrast between the clouds and the sky. When the clouds are white and the sky is deep blue, a filter that makes blue photograph darker than white will solve the problem, but when the clouds are white and the sky is a very pale blue or a bluish white, the visible contrast between the clouds and the sky is slight, and, even with a filter, we must give the minimum exposure that will record

the landscape detail if we wish the clouds to show in the print.

On the cloudy days when no blue sky is visible and the clouds show, as they so often do, tones ranging from white through the grays to almost a black, there is no problem to solve, for we can then record both the clouds and the landscape detail with a snapshot exposure, *without using a filter*, as is demon-

strated by Mr. Merrill's picture on page 22.

This picture was made on a cloudy-dull day with an exposure of 1/25 of a second through stop 4 (f.8). Had the day been cloudy-bright an exposure of 1/25 second through stop 8 (f.11), or a snapshot through the largest stop on a fixed focus camera, would have been ample.



MAKING FILMS LIE FLAT

AFTER films have been developed, fixed and washed they should be dried in a gentle current of air that is free from dust.

When films are placed in a current of air in the summer-time they dry gradually and evenly and when

wholly dry they will lie practically flat.

In cold climates films must be dried in heated rooms during the winter months, to prevent the water in the gelatine from freezing and ruining the negatives.

When films are dried near hot



PIAZZA DEL POPULO, ROME
Made with 3A Folding Kodak; f.8, 1-25 sec.

stoves or radiators, or over hot air registers, they dry very rapidly, but they do not dry evenly. Frequently both edges of the films and sections across their entire width will be "bone dry" while other parts of the films are still moist. Under these conditions the films will buckle in drying, and when dry will not lie flat. This difficulty can be avoided by drying the films ten feet or farther from the source of heat, and it can also be corrected after it has occurred by placing the *dry* films, say, half an inch apart, face down, on a sheet of clean paper, a few feet long, which is then rolled around an ordinary cardboard mailing tube, 1½ inches or more in diameter, so the films will be given a backward curve, that is, a

curve like the letter U, with the emulsion side of the film on the outside of the U.

If removed from the roll at the right time (usually at the end of two or three hours) they will lie as smooth and flat as a sheet of paper. If left in the roll for several hours they will retain the backward curve, but this curve can be readily removed and the films made perfectly flat by again placing them in the roll —other side up this time—and leaving them there about half an hour.

The writer has experimented extensively with the flattening of films that were dried under extremely unfavorable conditions, and has found that the roll will always perfectly flatten both roll films and film pack films when pressure alone would not accomplish this result.



A SEA ADVENTURE
Made with a Vest Pocket Kodak



AN AIR ATTACK
Made with 3A Folding Kodak

ORDER FILM BY NUMBER

HERE are many models of roll film cameras in use that make negatives of the same size but require film spools of different lengths. This is owing to differences in the styles of the cameras.

Should you order a certain size of film from your dealer, without mentioning the style of camera you are using, he might not know what you need, but if you order by number he will know exactly what to give you. To illustrate: The No. 3 Folding Pocket Kodak, the No. 3 Cartridge Kodak and the No. 3 Brownie all make $3\frac{1}{4} \times 4\frac{1}{4}$ nega-

tives, but they are different styles of cameras and require film spools of different lengths. The film made for one of these cameras will fit neither of the others.

Eastman N. C. Film and Eastman Autographic Film are packed in cartons. A number is placed on the ends of each carton. This number indicates the size of negative the film will make and the style of spool on which the film is wound.

The $3\frac{1}{4} \times 4\frac{1}{4}$ size of Eastman roll film is listed under four numbers, and is made for use in eight styles of Eastman cameras. Three

styles of these cameras use film No. 118, three styles use film No. 124, one style uses film No. 119 and only one style requires film No. A118.

The 3A size of film is listed under three numbers, the 4 x 5 size under four numbers and some other sizes are also listed under two or more numbers, for cameras of various styles.

The letter A preceding the number on a film carton indicates that the film is autographic. If you are using an Autographic Kodak, a Kodak fitted with an Autographic Back, or an Autographic Brownie, make sure you order Autographic Film. Autographic records

cannot be made on old style film.

Every year has witnessed improvements in Eastman Cameras. Some of these improvements have necessitated changes in the film spools. Since all models of Eastman cameras, from the oldest to the most recent, are in constant use, films must be supplied for all these models.

The number of the film used in any size or style of Eastman roll film camera is printed in large type in the manual that accompanies the camera.

Always order film by number that you may be sure of obtaining the film you need.



IN A FRENCH VILLAGE

Made with a Premo; Film Pack Film, K2 Filter; f.8, 1/2 sec.

KODAK SERVICE

IN the first number of KODAKERY, which was published five years ago, we invited all amateur photographers who wished assistance in their photographic work to send us negatives and prints for criticism.

This invitation was instantly accepted and it soon became evident that our readers were profiting more from our criticisms and from the suggestions we offered for the improvement of their future work than they could have profited from criticisms of pictures which they had not made themselves.

We wish to help all amateurs in solving such photographic problems as may confront them, and in order to render the best possible service we invite all who care for our assistance to send us prints and the negatives from which they were made, together with all the data possible.

What we would like to know is the month, the time of day, the stop used and the exposure given when the negatives were made, and also the name and grade of paper on which the prints were made.

By examining the negatives we can tell whether exposure and development were correct, and by comparing the prints with the negatives we can tell whether the trouble, if any, lies in the printing or in the making of the negatives. Both negatives and prints will be promptly returned.

The following extracts from a few of the many thousands of letters we have received, suggest what Kodak service, which is rendered *free of charge*, may mean to you.

"The information proved very valuable as I have had no trouble since. I am only sorry I did not come to you with my troubles at first, thereby saving many films."

"Your very cordial letter of the 24th is in hand. I thank you for it and your concern in helping me to obtain the desirable results in my attempt at photography."

"You have helped me out of my troubles before and I am sure you always will, so I am sending you some questions I wish you to answer."

ADDRESS ALL COMMUNICATIONS

"KODAKERY," CANADIAN KODAK CO., LIMITED

TORONTO, CANADA



3A
Autographic
Kodak Jr.

Pictures
 $3\frac{1}{4} \times 5\frac{1}{2}$

THERE is room in the amateur's equipment for a camera in the 3A size—the 3A Junior offers the opportunity, and at small cost.

From its size and proportions, the 3A picture is the most satisfying of any of the amateur sizes. It is this fact, coupled with its adaptability to the various forms of amateur picture-making, that has made the 3A size standard.

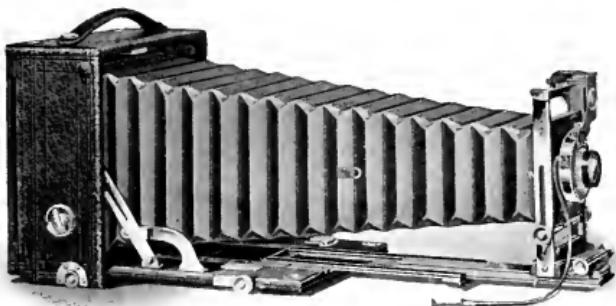
Details:—Capacity, ten exposures without reloading. Size of Kodak, $1\frac{1}{8} \times 5\frac{1}{8} \times 9\frac{3}{4}$ inches. Weight, 35 ounces. Lenses, meniscus achromatic or Rapid Rectilinear, focus $6\frac{5}{8}$ inches. Shutter Kodak Ball Bearing No. 2, with cable release. Automatic focusing lock. Two tripod sockets. Brilliant, collapsible, reversible finder.

No. 3A Autographic Kodak Jr. with meniscus achromatic lens and Kodak Ball Bearing Shutter	- - - - -	\$17.50
Ditto, with Rapid Rectilinear lens	- - - - -	20.00

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For the technical worker



PREMO No. 10

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Ask for the Premo catalogue, free at your dealer's or from us.

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The Kodak Album

With the summer's accumulation of prints, an album is the very thing—and here's the very album.

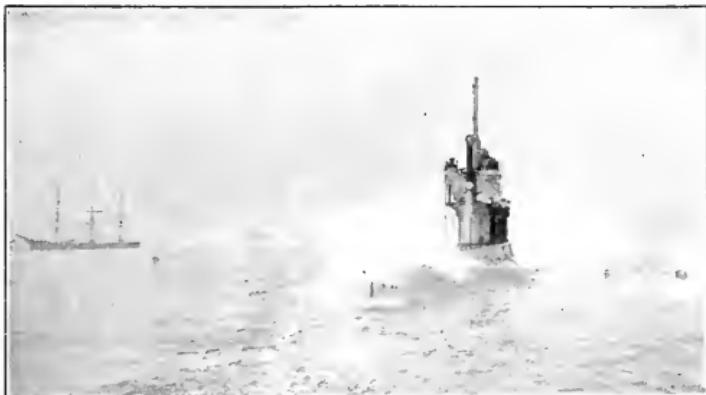
One-piece black narrow grained cow-hide—leather-lined. Leaves held in place by black silk cord through cover and metal tubes. Very flexible
—Oxford Bible style edges.

THE PRICE

4 $\frac{3}{4}$ x 7, A, 50 black leaves	\$3.75
7 x 11, B, 50 black leaves	5.50
Package 12 extra leaves, A, \$0.15 ; B, \$0.18	

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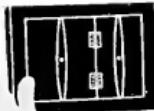
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ROYAL VELOX
and then re-develop.

The resulting rich, warm, Sepia tone gives added artistic value.

Read about this simple process of re-development in the Velox Book.

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Actual size of the

Vest Pocket Autographic Kodak

Obviously there is always room for it — room, for example, in your photographic equipment, where you frequently have need of a small, efficient camera that you can *wear*.

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With K. A. f. 7.7. lens . . . 15.00



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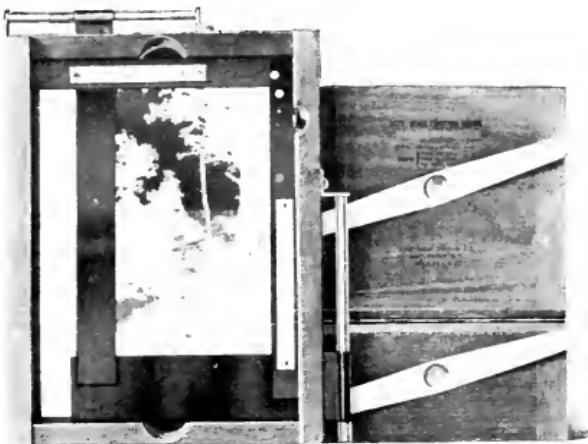
KODAKERY

A
MAGAZINE *for* AMATEUR
PHOTOGRAPHERS



JANUARY 1919

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Compared with the
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the ordinary printing frame is out of date.

The masking device adaptable to
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The Price, \$1.25

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If it isn't an Eastman
It isn't a Kodak



A VENETIAN CANAL.

Made with 5.1 Folding Kodak; f.8 stop; 1-to-sec. exposure



PUBLISHED MONTHLY—YEARLY SUBSCRIPTION, 50 CENTS; SINGLE COPIES, 5 CENTS.

VOL. VI

JANUARY, 1919

No. 3



THE LAGOON AND ST. GIORGIO, VENICE
Made with 3A Folding Kodak; stop 16; 1-25 sec. exposure

THE PICTURE GLORIES OF ITALY

BY ALBERT CRANE WALLACE

THE war has cast a shadow over the beauty of the world. Yet we may be cheered a little by the thought that the shadow, while it is real enough in the mental sense, is a physical shadow in only a small degree. Nature bravely keeps on being beautiful in the face of all, save only where the actual

touch of war scars and devastates.

Right back of the lines in France the flowers have bloomed as if nothing were happening. Some poet has pictured the amazement of the blossoms when a frightful shell tore its way into a peaceful, sunlit valley.

And what is true of the open



GARDEN OF THE VILLA BORGHESE IN ROME

Made with 3A Folding Kodak; f.22; ½ sec. exposure

country is true of the tranquil villages and teeming cities. Italy, for example, tortured as it has been by the ravages of the great conflict, spreads its gracious gardens, its soft landscapes, its splendid historical monuments, its picturesque cities and hamlets under the same old Italian sky, and life, while it feels with all the world the iron touch of the war, presents an outward appearance not greatly different from other times. The young men are away—there are few places in the world we are most familiar with in which this is not true—and eyes that know may quickly see the differences. But Italy as a picture has not lost and cannot lose its charm.

Even Venice, at the very brink of greatest danger, rears its quaint loveliness of line in calm and patient courage. Many architectural treasures have been bul-

deserted at times, it yet returns at warked against bombs. But most of the spreading sea city is of its accustomed cast. Almost wholly other times almost to its normal look. The twinkling, lazy, sinuous canals show little change.

No spot on earth has coaxed the painter and the photographer more frequently than Venice. And no spot on earth has furnished more satisfactory reward for artistic adventure.

What is true of Venice is true in a lesser degree, but still in a wonderfully inspiring way, of the "moldy gloom and dim splendor of old Rome." Really, with the sun in it Rome is not "dim," and pictures of the Forum, for example, stand out with significant vividness.

Florence, Genoa, Naples—all the most distinctive features of Italy's historic panorama—remain



A WATER BYWAY OF THE GRAND CANAL, VENICE
Made with 3A Folding Kodak; stop 16; 1-25 sec. exposure



STREET SCENE IN GENOA

Made with 3A Folding Kodak; f.8; 1-25 sec. exposure



untouched and unaltered. In public square, in arcades, splashed with brilliantly contrasting light effects, we see the figures of war, smart stepping officers, humble soldiers home on furlough, soldier groups and romantic couples gay in a brief reunion.

All the warring countries have the same stories to tell. In Italy the scenes stand out, however, with a quality quite their own. As Byron put it: "Italy, thou art the garden of the world, the home of all art yields, all nature can bestow. E'en in thy desert what is like to thee? Thy very weeds are beautiful, thy wreck a glory and thy ruin graced with an immaculate charm that cannot be defaced."

THE FORUM, ROME

f.22; 1-25 sec. exposure



SUNSHINE AND SHADOW

Made with g.I Folding Kodak; f.8, 1/25 sec., exposed



A HELPING HAND FOR THE ITALIAN VINEYARD GIRLS

British Official Photograph

SEPARATE FIXING BATHS FOR NEGATIVES AND PRINTS

CAN the fixing bath that is recommended for use with Velox paper also be used for fixing negatives? It can—but after it has been used for fixing negatives it should not be used for fixing prints. Negatives and prints should be fixed in separate baths.

The reason for this is that a fixing bath that is used for prints should always remain clear and colorless, while a bath that is used for fixing negatives will usually

become discolored before it is exhausted.

This is due to the fact that the developer is seldom completely washed out of the negatives before they are placed in the fixing bath, and is also due to the difference in the emulsions used for making negatives and prints. The unaltered silver the fixing process removes from a print does not show as a visible precipitate, while the silver the fixing process removes

from a negative forms a black precipitate in the bath.

A slightly discolored bath will not affect the quality of negatives, but it will often stain prints.

The fixing bath costs very little and can be used until exhausted. A 1-lb. package of Kodak Acid Fixing Powder, or a 1-lb. package of hypo acidified with Velox Liquid Hardener, will make 64 ounces of

solution, in which two gross of $3\frac{1}{4} \times 5\frac{1}{2}$ or 4×5 prints can be fixed. Either of these baths may also be used for fixing negatives as long as it will clear the negatives inside of fifteen minutes.

It is economy to use separate baths for negatives and prints. Fixing prints in a bath that may stain them is not economy—it is extravagance.



WHAT THE KODAK PORTRAIT ATTACHMENT DOES

THE nearer the lens is to the object that is photographed the larger, of course, will be the image of the object in the picture.

On focusing cameras it is the length of the bellows that determines how close to the subject the lens can be placed without making an out-of-focus picture.

Long bellows cameras are necessarily so much bulkier and so much heavier than the modern, compact hand cameras that make the same size of picture, that few people are willing to carry them about.

Modern hand cameras have bellows that are long enough for making sharp pictures of objects that are not nearer than six or eight feet, and if the images the lens makes at these distances are not as large as desired, larger ones can be obtained by placing a Kodak Portrait Attachment in front of the regular camera lens.

When a Kodak Portrait Attachment is used on a focusing camera that has a 6-foot mark on the focusing scale, sharp pictures can

be made with the subject only thirty-two inches from the lens. The exact distance that the front of the portrait attachment must be from the subject when the focus is set at any of the various distance marks on the focusing scale is stated in the instruction sheet that is furnished with every portrait attachment.

When a Kodak Portrait Attachment is used on the fixed focus types of Kodaks, Premos and Brownies the subject must be placed forty-two inches from the lens.

The pictures on pages 10 and 11 show the full sizes of the 3A Kodak images that were obtained with and without the use of a portrait attachment.

For making head and shoulder portraits, and for photographing flowers and other small objects at short range, the Kodak Portrait Attachment is indispensable to the users of compact hand cameras, as it enables them to do what could otherwise only be done with a long bellows camera.



Fifteen seconds at 1/15th. Image without Portrait Attachment



Full size of 3A Kodak Image with Portrait Attachment



SUCCESSIVE PHOTOGRAPHS OF THIS YEAR'S ECLIPSE
OF THE SUN

From a negative made by J. W. Bell

PHOTOGRAPHING THE SUN

On June 8th the attention of many people in this country was distracted from the war, for a few minutes, to contemplate the wonderful phenomenon occurring in the sky, this being the eclipse caused by the passage of the moon between the sun and the earth.

Eclipses in which the sun is partially obscured by the moon are fairly common, but it is rare for any portion of the earth to be visited by a total eclipse, in which the moon's disk completely covers that of the sun and produces an artificial and temporary night.

The eclipse of June 8th was the first eclipse in this century to be total in the United States, and over the band of totality it naturally excited the greatest possible interest. This band of totality extended from the Pacific to the Atlantic coast but was only about sixty miles wide, so that for most of the country the eclipse was seen only as a partial covering of the sun's disk by that of the moon. The partial eclipse lasted for about two hours, but at some places in the east the sun set before the moon was clear of its disk.

A Pennsylvania photographer



ONE QUARTER OF THE CORONA OF THE SUN AS SEEN
DURING TOTAL ECLIPSE

Courtesy of Professor E. B. Frost, Yerkes Observatory

had the happy thought of photographing the eclipse at intervals from the moment when the moon's disk was first seen touching that of the sun until the sun was hidden behind the trees on the horizon. He used an 8 x 10 camera and gave eighteen exposures in all. The lens was closed to its smallest opening, the shutter set at 1/100 of a second, and after seeing that the camera was rigidly set in its position, the shutter was snapped at five minute intervals. The photograph shows that at the beginning this gave too much exposure, so that some of the first exposures are buried in halation.

and the reflection of the sun's image from the various surfaces of the lens has produced spots of light on the negative of the kind known to the opticians as "flare" spots. But as the sun sank lower in the atmosphere and its light began to be obscured by the absorption of the air, the exposures gave admirable results.

To the astronomers, a total eclipse offers a rare and valuable opportunity. From the sun there are continually shooting out flames of incandescent gas which cannot be seen because of the intense light of the sun itself, while around the sun there spreads out into space a

wonderful phenomenon called the "corona," which is seen in an eclipse as a ring of pearly gray light, growing fainter and fainter as it recedes from the sun and spreading out into space on all sides. In order to photograph these phenomena a number of scientific expeditions went from the observatories to the belt in the country where the eclipse was total, and setting up temporary observatories with elaborate apparatus, they photographed the corona and the "prominences," as the flames of incandescent gas are called, and made measurements of the phenomena associated with the sun which can only be studied effectively when the sun's disk itself is eclipsed.

By courtesy of Professor Edwin B. Frost we are able to print a photograph showing a quarter of the circumference of the sun obscured by the moon's disk, projecting from the edge of which are

seen two gigantic prominences. This was taken by the expedition from Yerkes Observatory, of which Professor Frost is the director. The uppermost prominence shown looking like the skeleton of some prehistoric monster, projects no less than 47,000 miles from the surface of the sun, a distance nearly six times the diameter of the earth. The exposure for this photograph, which was made by Miss Mary R. Culver, was twenty seconds, the sun being somewhat obscured by clouds. In addition to the prominence, there is seen around the sun the light of the inner corona, this being the only portion which was bright enough to be recorded with the exposure given.

The astronomers are now busy studying the results which they have obtained, and drawing from them lessons which will in turn be used to plan new measurements to be made at the next eclipse.



A JOY RIDE

Made with an O Brownie



YOSEMITE FALLS

Marshall's "The Great Falls of the Tuolumne."

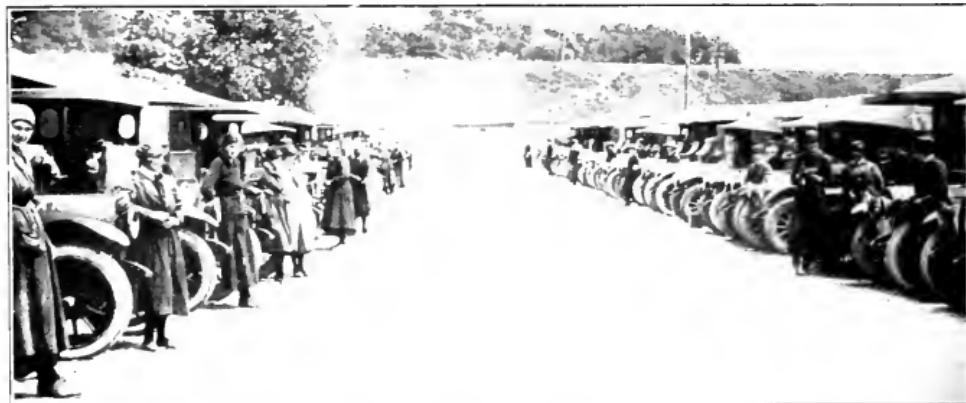
THE WAR DRAMA

FROM
BRITISH
OFFICIAL
PHOTOGRAPHS

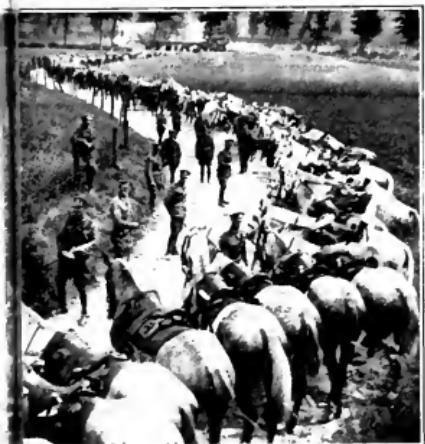


Wrecked
German
Raider

Cavalry Horse
in Training



British Women Ambulance Drivers



British
Big Gun
on Western
Front



120
Guns
Captured
Austria



Jolly Tommies in a Shelter

THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES

CHAPTER VIII—THE GELATINE FILM

THE silver grains which form the developed image are held in a layer of gelatine. This gelatine is used in making the emulsion which is coated on the support to make the sensitive film.

Gelatine is a very interesting substance, and its characteristics are markedly different from those of most other chemical substances. Most chemical substances form crystals, and many of them are soluble in water. When they are dissolved in water, the solution is quite homogeneous, that is to say, alike in its properties in all its parts. Substances generally will dissolve in water to a fixed extent, dependent on the temperature.

We say of one material, for instance, that it is soluble to the extent of 30%, meaning that a hundred parts of water will take up 30 parts of the material. If we heat the solution it will usually dissolve more, but then when it cools again the material salt will crystallize out so that whatever we do we can only obtain the fixed 30 parts per hundred remaining in solution.

Gelatine behaves quite differently to this. In cold water it does not dissolve but it swells, as if, instead of the gelatine dissolving in the water, the water dissolves in the gelatine. If the water is heated, the gelatine will dissolve in it, and it will dissolve to any extent. You cannot say that there is a definite solubility of gelatine in water. The more gelatine is added, the thicker the solution becomes, but there is no point at which the gelatine will refuse to dissolve.

If we heat a gelatine solution it will become thinner and less viscous when hot, and will not recover completely when cool; it will remain thinner than if it had not been heated, so that the heating of the gelatine solution produces a permanent change in its properties. If we cool a gelatine solution, the gelatine will not separate from the solution in a dry state, but the whole solution will set to a jelly, which we might consider a solution of water in the gelatine. If we heat the jelly it will melt again, and we can melt and reset a jelly many times, but in doing so we shall

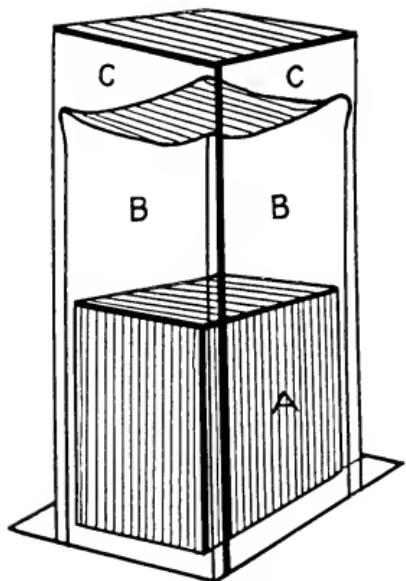


FIG. 1

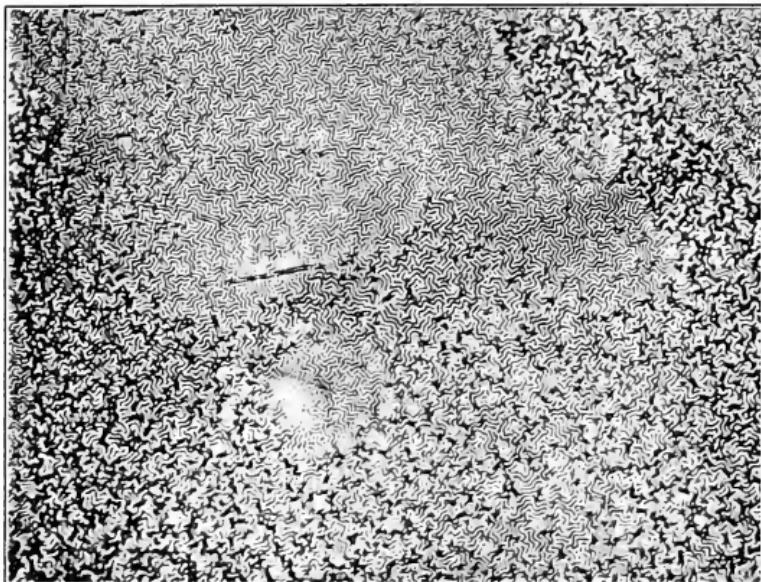


FIG. 2

produce a progressive change in the jelly, and if we continue the process too long, sooner or later it will refuse to set and will remain as a thick, gummy liquid.

Gelatine belongs to the class of substances which are called colloids, the name being derived from a Greek word meaning gummy.

When a gelatine jelly is dried, it shrinks down and forms a horny or glassy layer of the gelatine itself, smooth and rather brittle, and this dry gelatine when placed in water will at once absorb the water and swell up again to form a jelly.

An interesting and important property of the drying and swelling of gelatine is that it swells almost entirely in one direction, namely, that in which it was dried. This is illustrated in Fig. 1. In this, *A* represents a small cube cut out of

a sheet of gelatine which was originally dried in the horizontal plane when it was made. If this cube is placed in water, it will not swell in all directions, becoming a bigger cube, but it will swell almost entirely in the direction in which it dried down, and will take the form *B* and, finally, the form *C*.

The explanation of this directional swelling of the gelatine jelly, and also of the fact that gelatine solutions change permanently with heating, lies in the fact that gelatine is not a uniform substance but has an internal structure. Probably, gelatine has a structure somewhat like that of a sponge, but the structure is very small and has not the elasticity of the sponge.

When the gelatine is in the jelly state, it is as though the sponge were full of water, and then it is

fairly rigid, because of the water contained in the pores. When the water is dried out, the sponge structure shrinks down, and if it is stretched out in one direction by being coated on film or paper, for instance, it will shrink down vertically just as a sponge without elasticity would fall into a flat mass if placed on the table.

When the gelatine solution is heated and the gelatine dissolves, it seems at first to retain a certain amount of its structure, as if the sponge had disintegrated and was distributed through the solution but the sponge structure had not entirely disappeared. Then, if the temperature is raised, it behaves as if the structure were slowly breaking up and dissolving, so that after a considerable heating at a high temperature the whole solution becomes homogeneous. When this solution is cooled and, finally, set to a jelly, it has to re-establish a new sponge structure, and this will be different to the original one and probably of less strength.

This explanation of the behavior of gelatine, that it has an internal structure which can persist even in

solution, seems to account for most of its properties and behavior.

When a gelatine jelly contains only such an amount of water that it still contains a considerable proportion of gelatine, over 10% for instance, the jelly will be strong and tough, but if the jelly contains much less gelatine than this, it will be weak and likely to rupture on any kind of strain. This is a very important matter in dealing with photographic films. When the film is first placed in the developer the gelatine at once commences to swell. As long as it does not swell too much it is easily handled, but if it swells too far, then it becomes very tender and is likely to be damaged by touch, and in extreme cases will swell so much that it will loosen from its support or wrinkle up in what is called "reticulation."

The swelling of a gelatine film is influenced by the temperature of the solution in which it is placed and also by the presence of other substances in the solution. A small amount of either acid or alkali will produce a considerable increase in the swelling, and since the developer is alkaline and the fixing bath is acid, both these solutions have a great tendency to swell the gelatine, especially when they are warm. On the other hand, sulphites tend to prevent swelling, so that an increase in the concentration of the sulphite in a developer or fixing bath will diminish it. An even greater aid in preventing swelling is the hardener in the fixing bath. The hardening agents used in fixing baths are the alums, which not only prevent the swelling of the gelatine temporarily but which permanently harden the

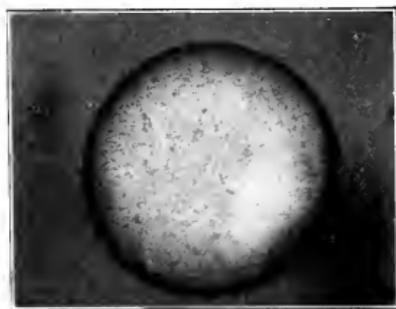


FIG. 3

Photograph, enlarged, of spot caused by water drop on dry negative

structure of the gelatine so that it will not easily swell. It is for this reason that the alum is introduced into the fixing bath so that after fixing the film will not become soft and disintegrate in washing.

Reticulation is due to local strains in the gelatine, and a sudden change in the temperature of solutions will sometimes produce this effect. If a film is transferred for instance, from a cold fixing bath containing a hardener to very warm wash water, the whole film will sometimes pucker into tiny reticulations, a good example of which is shown in Fig. 2. If one part of the film contains much more moisture than another, the silver image itself is liable to become distorted by the movement of the gelatine, and of the silver grains in it. If a drop of water, for instance, falls on a film and this is dried rapidly, it will often produce a curious ring-shaped mark, the middle of the drop being lighter and the edge of the drop darker than the surrounding negative, Fig. 3. The explanation of

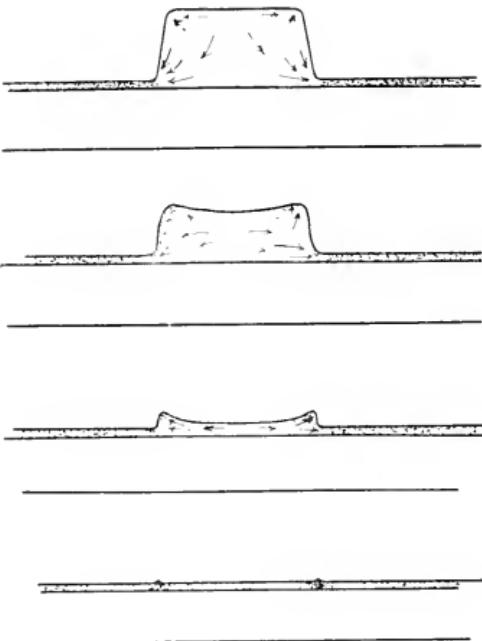


FIG. 4
Sectional Diagram, showing "Pulling" Action during drying of water spot

this is shown in Fig. 4. The gelatine swells up where the spot of water fell on it, and as it dries again a strain is produced by the collapse of the center of the swollen spot, and so the gelatine and silver grains are pulled in to the edges of the spot and there produce the dark ring.



TEMPERATURE OF THE DEVELOPER

ALWAYS test the temperature of the developer with a thermometer. If you use a tank be sure to develop negatives for the length of time that the tank instructions recommend for the tem-

perature. Negatives can be correctly developed in an Eastman tank at any temperature between 45 and 70 degrees. A tray developer should be between 60 and 70 degrees.

MAKING WHITE MARGIN PRINTS

WHITE margins on a black and white print serve as a frame for the picture and give it a finished appearance that would otherwise be lacking.

These margins are obtained by printing through the opening of an opaque mask. The mask is placed in contact with the negative in a printing frame and so adjusted that as much or as little of the negative as we wish to make a print from can be seen through the opening in the mask.

Printing masks can be made from opaque paper, but those who have made them realize the difficulty of cutting openings that will have exact right angle corners.

Nearly all the pictures we make can be improved by a judicious trimming of the margins, but when we make white margin prints we must do the trimming by masking the margins, and in order to secure the most pleasing effects, it is

usually necessary to cut a different mask for every negative.

By using a Kodak Auto Mask Printing Frame we can make white margin prints without having to cut masks. This frame contains two stationary and two movable thin metal strips with which a mask, that will fit any film negative from the Vest Pocket to the 3A or 4 x 5 size, can be instantly arranged. This is done by placing one end and one side of the film under the stationary strips, which hold the negative securely in position, and then sliding the movable strips along the rods on the outside of the frame until the size and shape of mask that is wanted is obtained.

By this method of masking a negative we can quickly adjust a mask for each negative and can make white margin prints that will include as much or as little as is wanted of what is within the picture area of the negative.



SOMEWHERE IN FRANCE

Made with 1.4 Folding Pocket Kodak



A FRENCH BYROAD
Made 500 - L'E. H. Knobell, 1900



RUINS OF THE TEMPLE OF MINOS, CRETE

PICTURES THAT TELL THE OBJECT'S SIZE

THE picture above, which shows a part of the ruined temple of Minos, on the island of Crete, gives us a splendid conception of the architectural features of the ruin, but it tells us nothing about the comparative size of the objects shown.

Because of the absence of a measuring rod, that is, the image of something of known size with which the images of the other objects can be compared, we cannot tell whether the windows and the archway are of ordinary or of extraordinary size.

The advantage of including a measuring standard in pictures of unfamiliar objects is shown by the illustration on page 25. By comparing the images of the columns

with the images of the men we can form a reasonably accurate idea of the height of the columns.

It is, of course, only when we photograph an unusually large or an unusually small object that we care to have the picture tell us what the size of the object is, and in order to make the picture do this we must place alongside (not far in front of or far behind) the subject some object whose size is known.

Years ago the writer made a photograph of one of the giant sequoias in a California big tree grove. There was no shrubbery about and there was nothing but the trunks of other big trees in the field of view with which the trunk of the giant that was selected as



BAALBEK, NEAR DAMASCUS, IN SYRIA

the principal object of interest could be compared. The picture conveyed no idea of the diameter of the trunk of the giant.

In making pictures that are intended to convey an approximate idea of the size of objects we should

remember that all things are measured by comparison with some known standard and that a picture cannot tell us the size of an unfamiliar object unless it also portrays some other object whose dimensions are known.



ROYAL BROMIDE

Most of the sepia toned enlargements you see in dealers' stores and in your friends' houses are on Royal Bromide, because, for more years than one might think, this paper has been the unexcelled medium for producing sepia enlargements.

Its established reputation in the special field named has worked an

injustice to this sterling paper, inasmuch as few photographers realize the beauty and charm of enlargements on Royal in black and white, pure and simple. The stock or base used for this paper is tinted, as you know, and it is this tinted stock that makes Royal such a fine paper for black and white results, where enlargements of fair size

are desired from negatives with broad shadows and general sketchy effect. The tint reduces the harshness of the black and imparts a characteristic mellowness to the picture, coupled with a welcome lessening of the cold massiveness that is apt to show itself in enlargements made on white stock.

For straight black and white prints on Royal, development should not be carried as far as indicated for prints that are to be toned—rather you should develop as you would prints on other Bromide papers, which are to be retained in the original color.



SIMPLE IMPROVEMENTS

The best of us sometimes err and make negatives that are not first-class printers, but can be improved by some form of after treatment, such as intensification of a fully exposed but underdeveloped negative or the reduction of one that has been developed to an excessive density.

Both of these processes are quite simple, requiring no special skill.

The one condition precedent that must be observed is the thorough fixation of the negative followed by complete elimination of the Hypo by adequate washing. Your dealer can supply ready-for-use chemical preparations for intensification and for reduction. Directions are given in detail on the labels, where you are also reminded about thorough fixing and washing.



IN THE CANADIAN ROCKIES

Made with 3A Folding Kodak

KODAK SERVICE

IN the first number of KODAKERY, which was published five years ago, we invited all amateur photographers who wished assistance in their photographic work to send us negatives and prints for criticism.

This invitation was instantly accepted and it soon became evident that our readers were profiting more from our criticisms and from the suggestions we offered for the improvement of their future work than they could have profited from criticisms of pictures which they had not made themselves.

We wish to help all amateurs in solving such photographic problems as may confront them, and in order to render the best possible service we invite all who care for our assistance to send us prints and the negatives from which they were made, together with all the data possible.

What we would like to know is the month, the time of day, the stop used and the exposure given when the negatives were made, and also the name and grade of paper on which the prints were made.

By examining the negatives we can tell whether exposure and development were correct, and by comparing the prints with the negatives we can tell whether the trouble, if any, lies in the printing or in the making of the negatives. Both negatives and prints will be promptly returned.

The following extracts from a few of the many thousands of letters we have received, suggest what Kodak service, which is rendered *free of charge*, may mean to you.

"The information proved very valuable as I have had no trouble since. I am only sorry I did not come to you with my troubles at first, thereby saving many films."

"Your very cordial letter of the 24th is in hand. I thank you for it and for your concern in helping me to obtain the desirable results in my attempt at photography."

"You have helped me out of my troubles before and I am sure you always will, so I am sending you some questions I wish you to answer."

ADDRESS ALL COMMUNICATIONS

"KODAKERY," CANADIAN KODAK CO., LIMITED

TORONTO, CANADA

The Kodak Portrait Attachment



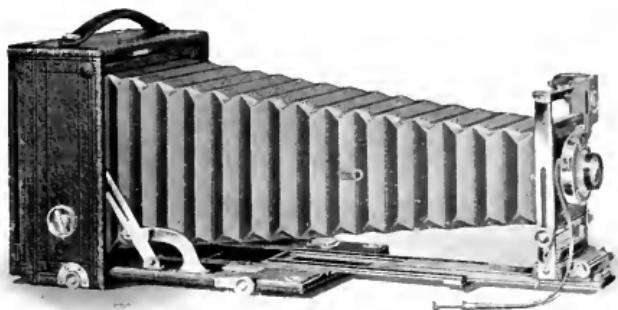
Fits your Kodak for head and shoulder portraits--it brings the camera in sharp focus at short range. You will want one for every occasion.

KODAK PORTRAIT ATTACHMENT

Price, 50c.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

For the technical worker



PREMO No. 10

COPYING, enlarging and architectural work are provided for in the long bellows draw, drop bed and swing back construction.

The ground glass offers the advantage of accurate focusing and composition. The camera takes 5x7 films or plates with equal facility, and while designed to meet all the requirements of amateur photography, it is also suitable for the technical and advanced photographic worker.

Ask for the Premo catalogue, free at your dealer's or from us.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

Premo Film Pack Tank



Correct development of negatives is essential to the best photographic result.

The tank method of development is automatic and scientifically exact.

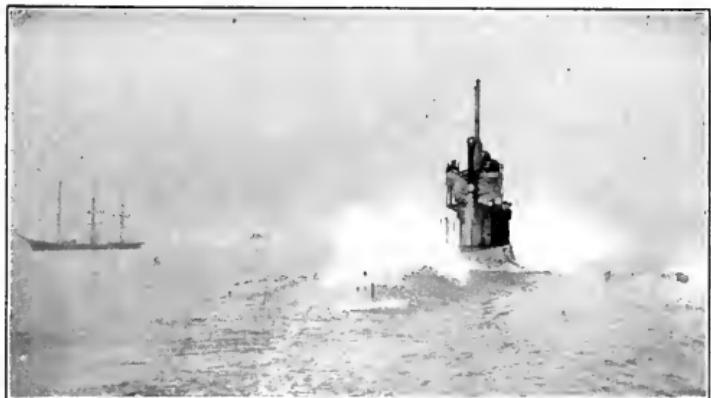
Technical skill is not required with the Premo Film Pack Tank—it is only necessary to follow the simple instructions provided.

Premo Film Pack Tanks and the developing powders occupy such a small space they may be carried without inconvenience, providing the means for immediately verifying exposures, when working in isolated localities.

*Ask your dealer, or write
us, for Premo Catalogue.*

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

*A Dull, Cloudy Day—
but a Perfect Snapshot*



THE remarkable speed of the Graflex does more than stop motion—it makes fully exposed snapshots possible in *poor light*. You'll save many an otherwise hopeless picture with the aid of the

GRAFLEX CAMERA

*Ask for the Graflex Catalogue,
free at your dealer's or by mail*

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

Frame your Pictures

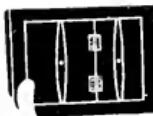
There are at least a dozen of your negatives which will make contact prints that are worth framing, for while they are diminutive, they are none the less real pictures. Your dealer can furnish all ready for the placing of the prints

Kodak Snapshot Frames

to take contact prints of all the popular amateur sizes from Vest Pocket up to full Post Card dimensions ($3\frac{1}{2} \times 5\frac{1}{2}$). He can also furnish frames ready for the placing of enlarged pictures of 5×7 , $6\frac{1}{2} \times 8\frac{1}{2}$ and 8×10 sizes.

The frames are made of good wood, in a Brownish Mission finish, suitable for sepia as well as black and white prints. They come with glass, backing mat, and hangers—truly ready-to-use.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA



You *see* the possibilities of a negative
as you hold it to the light.

VELOX

realizes them.

The best print you can get on Velox
is the best print you can get.

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At your dealer's.

Actual size of the

Vest Pocket Autographic Kodak

Obviously there is always room for it — room, for example, in your photographic equipment, where you frequently have need of a small, efficient camera that you can *wear*.

With Meniscus Achromatic lens, \$8.50

With K. A. f. 7.7. lens . . . 15.00



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KODAKERY

A
MAGAZINE *for* AMATEUR
PHOTOGRAPHERS



FEBRUARY 1919

CANADIAN KODAK CO., LIMITED.
TORONTO, CANADA.

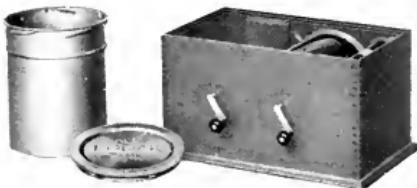
Pictures for Soldiers



Develop and print
them yourself the
easy, economical
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The Kodak Amateur Printer
makes good printing easy.
Price \$6.00

A n i d e a l
gift — either
separately or
in combination.



The Kodak Film Tank makes
proper development sure.
Price \$2.75 and up

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TORONTO, CANADA

At your dealer's



If it isn't an Eastman
It isn't a Kodak



NATURE'S GATE—COAST OF FRANCE, NEAR BREST
Made with 3A Folding Kodak; f.8; 1-25 sec. exposure



PUBLISHED MONTHLY—YEARLY SUBSCRIPTION, 50 CENTS; SINGLE COPIES, 5 CENTS.

VOL. VI.

FEBRUARY, 1919

No. 4



RECEPTION OF GENERAL ALLENBY IN JERUSALEM

THE DELIVERY OF JERUSALEM

BY ALBERT CRANE WALLACE

Illustrated with British Official Photographs

THE great service of photography in recording the history of the modern world is nowhere made more striking than in the records of happenings in re-

gions recalling vastly earlier times.

I have been forcibly reminded of this by the instance of Jerusalem. There are many other reminders from old France—as in the



THE CEREMONY OF THE HOLY FIRE

shattered pinnacles of Rheims cathedral against a background of seven hundred years—but the sacred places of Palestine somehow make the modern revelation more significant. The photograph gives a vivid reality to incidents and places that come to us gratefully when we have an intensity of interest beyond the simply historical.

The camera is, indeed, seeing a novel situation in Jerusalem and its sister towns. Nothing in the unfolding of the Great War had more of dramatic emotion than the wresting of the holy city from the cruel clutches of the Turkish government.

General Sir Edmund Allenby's entrance into the city was a simple and not a swaggering matter.

There was something profoundly solemn about the incident as an historical event that doubtless affected the whole procedure. The British hero was hailed with a joy that was grave and devout. Many of the civic and religious ceremonies were pictured. From the first moment the population was made to feel that it was free—free as to its various forms of religion, free as to its customs and its business. Naturally this liberty has reflected itself in the life of the city, the more as its freedom was not isolated, but became a phase of the new condition brought to the holy country beyond.

Jerusalem has an altitude of about 2,600 ft. above the Mediterranean; it has been sharply divided as to "quarters"—a Christian



THE LANCERS PASSING THROUGH THE STREETS OF JERUSALEM
(JUST OUTSIDE THE JAFFA GATE)



THE MILITARY GOVERNOR SALUTING THE HOLY FLAGS

quarter, a Jewish quarter, a Mohammedan quarter, and an Armenian quarter. Doubtless under the newer jurisdiction these divisions will become less arbitrary. Certainly after a change so radical, following hundreds of years of discordant rule, the sacred city may be expected to take on certain transformations. Since last Christmas Day the eyes of the world have turned to it again and again with an interest fully explained by its peculiar history, by the part it has played in the history of the world.

The Crusaders in the day of Richard the Lion Hearted never dreamed of the situation presented in these pages. Who would not like to see photographs of Richard's gorgeously panoplied troops on

their extraordinary journey? It may be a foolish thought, yet even the thinking of it gives a curious pleasure to the imagination—at least to mine. It is impossible to study a group of photographs having record interest of this sort without considering the contrast in the opportunities to be looked for in the future and those possessed by the past. For all of our enthusiasms as to photography I believe it is quite likely that we have underestimated the value to future historians that lies in camera stories we now take for granted—not in such instances as a matter of art, but as a matter of human interest. And no interest ever can outrank human interest—ask the soldier who gets pictures from home!



FLEECY SNOW OF EARLY WINTER

Made with a 3.4 Folding Kodak on Kodak Film. Stop, 16; 1-25 sec.

WHEN THE SNOW COMES

In most of the landscape subjects we photograph during the summer months the foreground contains detail and the predominating tones of the ground are dark, but in winter, when the ground is covered with snow, the foreground is often wholly void of detail and it reflects almost as strong a light as that which comes from the sky.

A picture in which the foreground is a blank mass of white may represent a snow scene just as we saw it, but when we examine such a picture we cannot but feel that it is pictorially unsatisfactory. By changing the foreground before the photograph is made we can add pictorial interest to the scene which will greatly improve the picture.

This can frequently be done on a sunny day by selecting a point of view from which the shadows of nearby objects will extend across

the foreground, and it can always be done, whether the day is sunny or cloudy, by tramping through the snow so the foreground will show footprints or the lines of a path.

The snow that has been shoveled from roadways and walks and lies piled in hillocks or ridges will furnish interesting foreground detail when the lens faces the shadow side of the snow.

When a heavy thaw comes after a few inches of snow have fallen many a scene similar to the one shown above can be observed along the creeks. Pictures of this type are most easily obtained in early winter when the waterways are still open and the low growing vegetation has not yet been packed beneath the snow.

This picture was made at about 4 o'clock when the sun was diagonally in front of the camera. To prevent the sun from shining on



TRIANON GARDENS, VERSAILLES
Made with a Premo on Film Pack Film; f.22; 1/4 sec.

the lens and fogging the film a note-book was held above and in front of the lens, outside its field of view, in such a position that it cast a shadow on the lens.

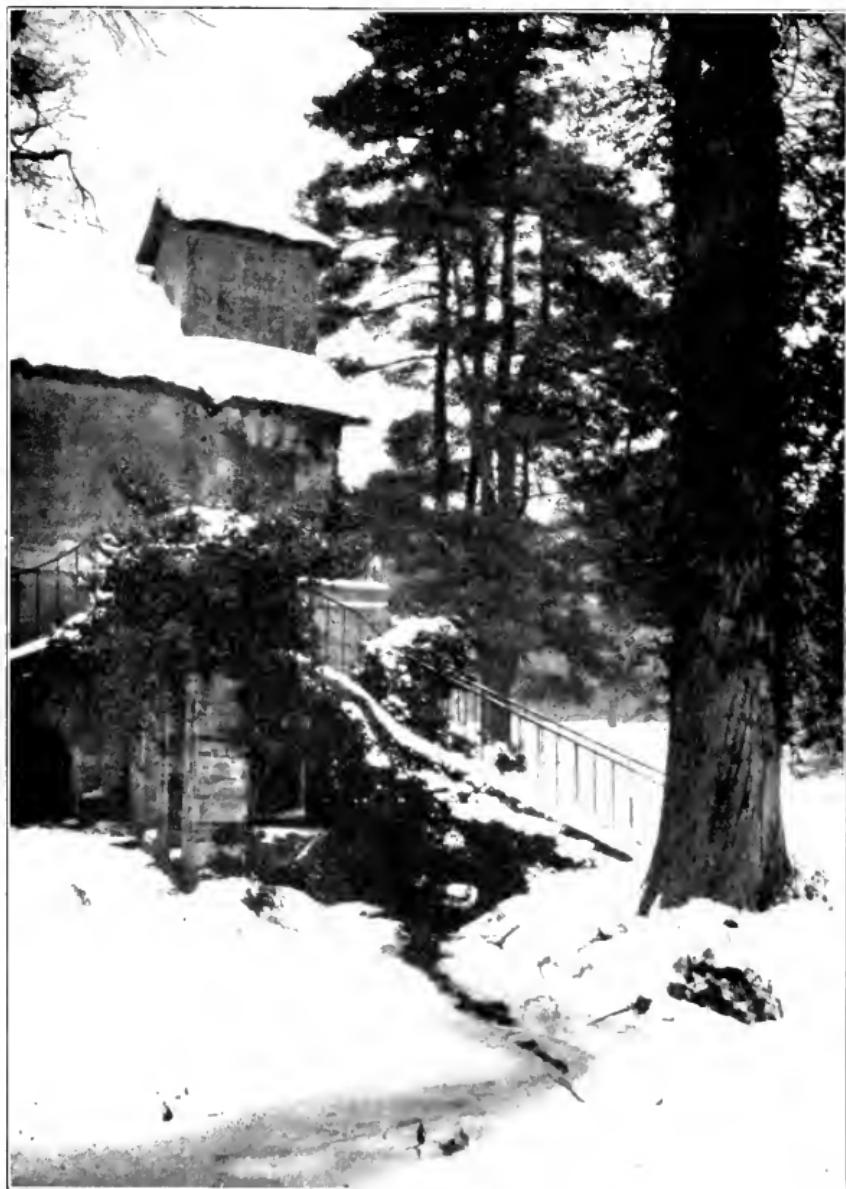
In photographing snow scenes our aim should be to record all the tones that are reflected by the snow. This is why, when the sun is shining, it is usually best to photograph against the light and *expose for the foreground shadows on the snow*. When this is done these shadows, and the tones that are lighter and also those that are darker than these shadows, can be recorded with an ordinary snapshot exposure when a fixed focus camera is used or with a 1/25 second exposure through stop 16 when using a focusing camera.

Sunshine adds brilliancy to the

lighting but it also increases contrast between the strongest lights and the deepest shadows, and when there is ample contrast in the subject the most pleasing pictures can frequently be obtained on cloudy-bright days.

When nearby dark objects which receive the light from the sky and the light reflected from the snow are photographed, softer effects can be obtained when it is cloudy-bright than when strong sunlight casts pronounced shadows. This is the reason why some photographers prefer to picture subjects similar to those shown on this and the page following when no sun shadows are visible.

The pictures that are sure to awaken the pleasant memories in the years to come are those that



TRIANON GARDENS, VERSAILLES

Taken with a French 6x9cm Film Pack, F/1.8m, f/2.2, 1/50 sec.

remind us of our home and the familiar, everyday scenes and incidents of our home town. Winter scenes and winter pastimes differ

from those of the summer months and it is only by picturing them that we can keep our records complete.



TEMPERATURE

THE development of a negative is the result of a definite chemical action; certain active ingredients of the developer unite with other substances in the sensitive film and free silver grains make their appearance where light has acted.

Nearly all chemical actions are subject to the control of temperature, and development is no exception to this rule. Raising the temperature accelerates and lowering it decreases the action. It is therefore of the utmost importance,

if good results are to be uniformly obtained, to keep all developing solutions at normal— 68° or 70° Fahr.—for variations from the correct temperature will not only produce various degrees of development, but varying quality as well.

At this season the light is often blamed for poor results when too cold a developer was the real cause. An Eastman Thermometer will substitute knowledge for guess-work as to the temperature of your solution.



IN AN OLD SERBIAN TOWN
Made with a 3-4 Kodak, by Merle LaVoy



BRITISH WOMEN AMBULANCE DRIVERS WHO HAVE WON HONORS IN FRANCE



CANADIAN RED CROSS GIRLS IN A TUG-OF-WAR ON A FRENCH FIELD
From British Official Photographs



FIG. 1
From the Original Negative

PHOTOGRAPHIC CAMEOS

THREE is often a lot of fun, especially in the long winter evenings, in what might be termed "stunt photography." And one of the most delightful stunts is the making of photographic cameos.

As we look at the image on a coin that is held horizontally near a window we can see a line of light along that edge of the image which is nearest to the light and a shadow line along the edge that is farthest from the light. This is due to the fact that the image on the coin is in relief, like the image on a cameo.

When a coin is photographed by a light that comes from the side the picture will plainly show the line of light on one side and the shadow line on the other side of the image and, though the picture is on a perfectly flat surface, it will convey the idea of an image in relief.

Pictures that convey this same idea can be made from ordinary negatives of any objects that have bold outlines. The way to do this, and thus obtain photographic cameos, is to make a film positive, that is, a picture on film, from the negative, in a printing frame, then place this positive over the negative and make a print in the ordinary way.

The result obtained will depend on how nearly the density of the positive equals the density of the negative and how much out of register the positive is with the negative.

When a positive that is of the same density throughout as the negative is placed over the negative so that all parts of the positive image are in perfect register with all parts of the negative image, the positive will neutralize the negative



Fig. 2
Positive of Lesser Density than Negative

so that no image can be seen by looking through the films. This is the ideal combination for making photographic cameos, which can be obtained from two such films by

merely moving the positive so it will be slightly out of register with the negative and then making a print in the usual way.

When the positive is of much



Fig. 3
Positive Only Slightly Less Dense than Negative



FIG. 4

*Result of Printing from Positive and Negative of Equal Density,
Slightly Shifted in Position*

lesser density than the negative a result similar to that shown in Fig. 2 can be obtained. By comparing Fig. 2 with Fig. 1—the latter showing a print from the negative that was made in the camera—it will be seen that the weak positive film made an important change in the rendering of the subject.

The positive that was placed over the negative for printing Fig. 3 was of greater density than the one used for Fig. 2 though it was not as dense as the negative. While Fig. 3 is a step nearer a cameo effect it still fails to convey the full idea of relief.

Fig. 4 does suggest an image in relief, because the positive used was of the same density as the negative. When these films were in exact register with each other they neutralized each other, and the image shown in Fig. 4 is solely the result of making the print with

the positive slightly out of register with the negative.

Suitable positives can be made on Eastman roll film, and Eastman Film Pack Film. Those who have dark rooms that are light-proof can use the same film for making the positives that they use for making negatives, but as negative film is extremely sensitive to light, care must be taken not to overprint the positive.

The writer places a sheet of ground glass over the front of the printing frame for diffusing and subduing the light, and prints the positive by the light of a small pocket flash-lamp, or by the light of a match, either of which is held about eighteen inches from the center of the front of the printing frame. No definite rule can be given for the length of time to print, but the exposure to either of the lights mentioned, will be

very brief, usually from 2 to 5 seconds.

A photographic dark room will, of course, be necessary when working with N. C. Film, owing to its great sensitiveness to light, and to those not so provided we recommend that they do the work at night, when it is usually not difficult to completely exclude the light from a suitable room. N. C. Film being color sensitive, development must be conducted in a safe ruby light which is obtained when a series 1B or 2 Wratten Safelight is used in a Kodak or Brownie Safelight Lamp.

Eastman Special Developing Powders are in every way suitable for development. To ensure even action of the developer it is well to soak the film in water for a minute or so, but both during the preliminary soaking and actual development, do not expose the film to the red light more than is absolutely necessary.

All the positives made should record the detail that is in the negative, and to insure this they must all receive the same exposure. Positives of different densities can be secured by developing films that received the same exposure for different lengths of time.

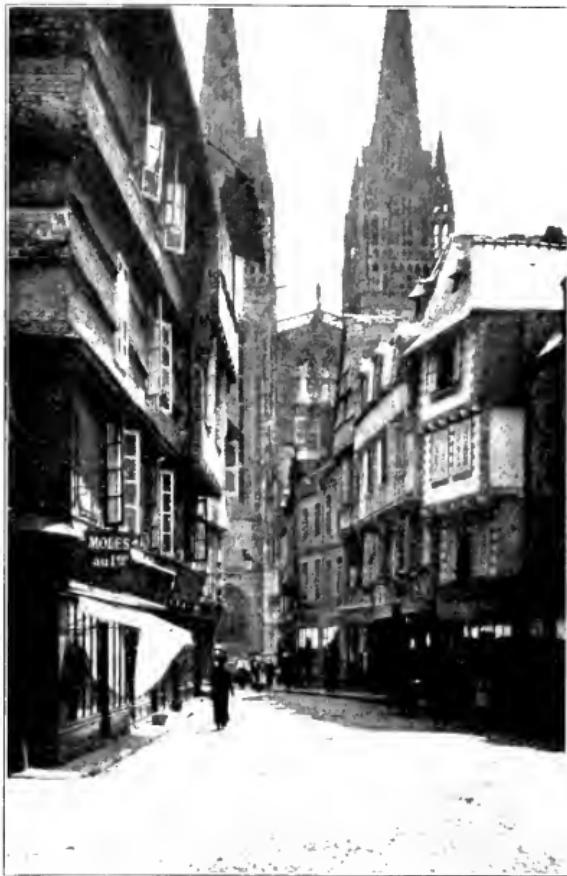
Our illustrations show but a few of the many interesting effects that can be obtained by the method we have described. This method is as suitable for making enlargements as it is for making contact prints. When several pictures are to be made from the same negative and positive, it is best to fasten one edge of the films together with gummed paper, so the register will not be shifted while the films are in the frame.

Photographic cameos that are surrounded by white margins are especially pleasing. The easiest way to mask the films for securing white margin prints is by using a Kodak Auto Mask Printing Frame.



AMERICAN RELIEF WORKERS IN FRANCE
From a photograph by Donald C. Thompson

IN NORTHE



Quimper and Its Cathedral; *f*.16; 1-25 sec.



A Quiet Village; *f*.16; 1-25 sec.



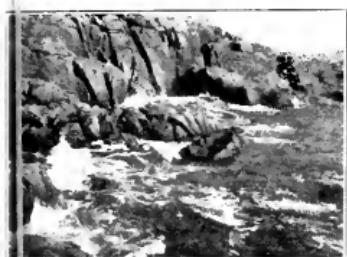
A Fishing Port; *f*.22;
1-25 sec. exposure



Cathedral at Quimper; *f*.16; 1-10 sec.

N FRANCE

STUDIES IN OLD
FRITTANY MADE
WITH A KODAK



A Bit of Rocky Coast; f.22
1-25 sec. exposure



Brittany Churchyard; f.16; 1-5 sec.



The City Gate, Dinan; f.16; 1-10 sec.



At Douarnenez; f.16; 1-2 sec.

THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES

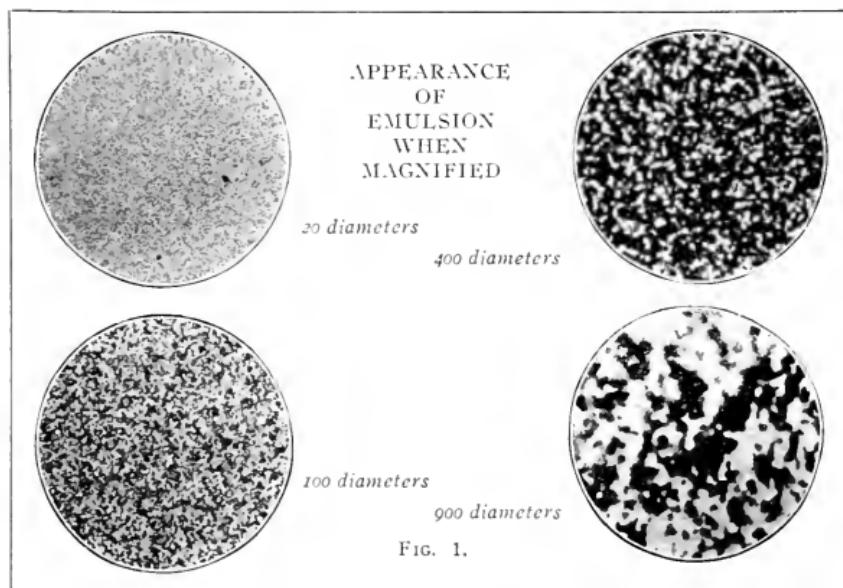
CHAPTER IX—THE STRUCTURE OF THE DEVELOPED IMAGE

THE developed image consists of grains of silver, each grain under sufficient magnification looking like a little mass of coke, replacing one of the silver bromide crystals which were originally formed in the emulsion and keeping the same position. (This was shown in Chapter V., where a picture is given showing silver bromide crystals before and after development). Now, when we look at a negative it appears perfectly smooth to the eye, but under a small degree of magnification it begins to show an appearance of graininess.

It must not be thought, however, that with a magnifying glass we can

see the silver grains themselves. The silver grains are so small that to make them visible requires powerful magnification. What we see through the magnifying glass are clumps of grains.

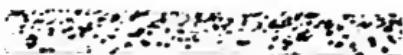
Suppose that an aviator is flying over country dotted with occasional woods and clumps of bushes. If he is flying near to the ground, he will be able to distinguish the separate trees and bushes. If he goes higher, he will no longer be able to see them separately but he will see them in little clumps of two and three where they are close together with the spaces where they are farther apart showing between them, and then as he goes



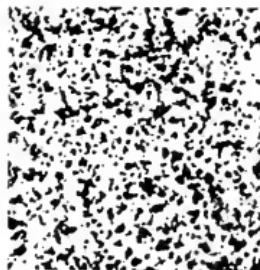
higher still he will no longer be able to see these small clumps, but will be able to see only the large masses of woodland or forest. In the same way, when we look at a negative under a low magnification, we see the larger masses of clumps of grains, and then as we increase the magnification we see the smaller clumps of grains, and then finally at a very high magnification we see the grains themselves, Fig. 1.

These clumps of grains which we can see under low magnification are made up of grains which are not all in the same layer. This can be seen by first of all photographing an image from above and then cutting a section down through it so as to see how the grains lie one below the other. In Fig. 2-A it will be seen that the image is as much as six grains deep so that many of the clumps of grains seen in Fig. 2-B are not made up of grains in the same layer but of grains in different layers, some on the top and some below.

The distribution of the grains in the depth of the film is interesting. It might be thought that with short exposures the image would be on the top of the film and that as the exposure was continued, the light would penetrate farther and farther into the film, making the grains in the lower layers more and more developable. This sometimes seems to be the case, but with some emulsions it is not so, as is proved by the photographs of sections shown in Fig. 3, which are cut from an N. C. film. These are fully developed so that the effect of development is eliminated, and they



A

Vertical Section Showing Grain Deposit

B

Horizontal Plan of Same Grain Deposit

FIG. 2.

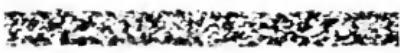
show that the grains are exposed at all parts of the film to an almost equal extent, though in the second and third prints there is a slight tendency for the image to be more on the top of the film. It looks as though the emulsion contains grains of various degrees of sensitivity and the more sensitive grains are made developable first. Further, since there is certainly more light at the surface of the film, it must be a fact that the more sensitive grains are found in the lower parts of the film.

During development, however, there is an appreciable effect due to the penetration of the developer into the film. This is shown in Fig. 4, where it is seen that at the beginning of development only the surface of the emulsion is developed, and then as development



Exposed 1 unit of time

Exposed 16 units of time



Exposed 4 units of time

Exposed 64 units of time

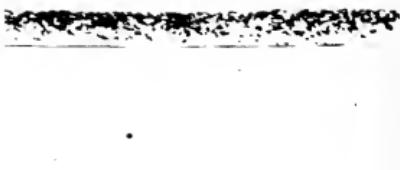
FIG. 3

continues the developer penetrates into the film and develops more and more deeply in it. In the case of a strong developer this effect is accentuated, because a strong developer will develop the surface to good density before it has penetrated through the emulsion, while a weak developer will penetrate at the same rate as the strong developer and will not develop so rapidly, so that with a strong developer there is a

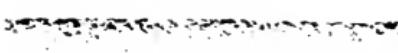
tendency for the image to be confined to the surface of the emulsion and with a weaker developer for it to penetrate through the whole emulsion. This effect is well shown in Fig. 5, where two photographs are shown of the edge of an exposed image, the image being shown as the dark part on the left, while on the right we have the light deposit of grains due to fog. In the upper picture, the image was developed



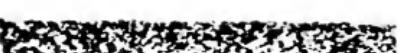
1



3



2



4

FIG. 4

Showing Progress of Development from Surface to Base of Emulsion

A*Strong or Concentrated Developer***A***Weak or Diluted Developer*

FIG. 5

with a very strong developer, while in the lower picture it was developed with a much weaker developer, and it will be noted that the weak developer has penetrated right through the image to the back, while with the strong developer the image has not developed through to the back of the film, although care was taken to develop the image to the same apparent density.

There is a curious effect shown in these photographs at the point

marked A, where it is seen that at the edge of the developed image the fog grains are not developed in the lower part of the film; it is as if they had been eaten away. There is no doubt that the reason for this is that the bromide liberated during development of the heavy image has prevented the fog grains close to the edge of the image from developing. In extreme cases this will sometimes surround a dense image with a white line.



THE HOMESTEAD
Made with a Kodak



BEACH FUN

Made with a No. 1A Kodak

PICTURES FROM HOME DELIGHT THE BOYS AT THE FRONT

One Soldier in State of Ecstasy Over Receipt of Five Family Snapshots

BY FRANK J. TAYLOR

(United Press Staff Correspondent)

From American Kodakery

WITH THE AMERICAN TROOPS IN FRANCE, Aug. 17th (Delayed).—This is the story of a single doughboy, but it is a yarn with more than a million morals.

He was not an unusual doughboy in any way, except that he was happy, as happy as a bird with its first touch of spring fever. You could tell it by looking at him, and he would tell you without your looking at him.

"Say, I feel so happy I could almost reach up and touch the sky," he exclaimed. "Look at that—wouldn't you."

He displayed an envelope.

"Good letter from home, is it?

Somebody must have sent you some money?"

"Money! There's something that's got money beat a mile," he replied. "That is, from a doughboy's point of view. Want to see what it is?"

"Sure. Anything that makes people as happy as you ought to be passed around."

He brought out five small photos, snapshots made by a small camera.

"Pretty nice, aren't they! See this one? It's my girl. She's the best girl going, and she knows how to make a hit with this doughboy over here. She sends snapshots every couple of weeks of the folks at home. Some girl, isn't she?"



THE PICNIC
Made with No. 1A Kodak Junior

You had to admit she was.

"This is another picture of hers, taken in her front yard under the trees. I know the spot. Gee, when I looked at that picture I almost felt as though I were back there with her, and it was Sunday afternoon. That's where I proposed to her, on that spot. She couldn't see it at first, but I won out after a bit. It sure is wonderful what snapshots bring back to you, isn't it?"

Again you had to admit the doughboy was right.

"Here's another one of her, showing her new duds and hat. Looks kind of military, doesn't it? I kind of like it, don't you. She's got good taste, that girl of mine, hasn't she?"

Evidently she had, and so had he. You admired his choice.

"This picture's of my mother," he continued, "and it's a good one. I wanted a snapshot of mother.

She looks pretty well. I was afraid she was worrying too much. I feel a lot better now. I know she's telling the truth when she said she was well. Photos are great, aren't they?

"This last one's my sister and her baby. She got married just before I left. I've been over here for two service stripes now. I'm tickled to get this photo. It's the only way I have of telling what kind of a brat I'm being uncle to, you see. Say, what paper are you corresponding for?"

"The United Press."

"That's a whole lot of papers, isn't it? Say, you know what you ought to do?"

"Write a story and tell everybody how much us boys over here want snapshots of the folks back home. Tell 'em pictures are the best thing they can send us. We don't care if they cut off our

packages so long as we can get pictures.

"Of course we can't send pictures of ourselves home, because it's against the rules. But we always look the same in uniforms, anyway. But snapshots sure make

you feel close to the folks back home."

The more than a million morals to this story are the more than a million doughboys who are longing for snapshots of the "folks back home."—*Chicago Tribune*.



A
SUNSHINE
BOY

Made with
1.A Kodak
by
George
Weldon



IN OSTEND HARBOR (IN THE OLD DAYS)

Made with No. 1A Kodak Jr.

ON THE NEGATIVE

8-16-18/10A/16. 1/25 CL.

THE above is not a German cipher code ordering the destruction of a passenger ship. It's just a suggestion for important data on the autographic negative.

First of all the date, August 16, 1918. There's no telling when the establishment of a date may become important. If it's a picture of the youngster, it will answer beyond dispute the interesting question of "how old was Jimmie when that snap was taken?" Such dates can answer the oft puzzling questions "what year were we at Muskoka and when did we go to Banff?" Perhaps it's only a picture in your backyard, but it may

establish the year that you set out the rose bushes or planted that elm that has grown so wonderfully.

Pick up a handful of your old prints—look them over and try to tell from memory *when* the negatives were made—and you will in future never fail to date the negative.

"10A" tells you that the picture was made at ten in the morning; "16" tells you that you used the sixteen stop; "1/25" tells you that the exposure was one twenty-fifth of a second, and "CL" means that the sky was clear. Whether it was a landscape or a marine or a close-up portrait, the negative itself will tell you, so there's no use writing down such data. You should

establish your own code for further data about the light conditions. "l. c." for light clouds, "edy" for cloudy and "d" for dark or very cloudy would help you admirably. If you are new at photography such simple records, taken in connection with the nature of the subject as shown by the negative itself,

will be of immense help to you in arriving at correct exposures in the future.

Autographic film costs you no more than ordinary film. Keeping the dates costs you almost no trouble—it's the work of an instant—and as time goes on it is likely to be highly important.



PLAYMATES
Made with a Kodak

WHEN IN NEED OF ASSISTANCE

"I have always received so much help from KODAKERY when I was in trouble, I venture to seek aid for a friend."

THIS extract, from one of the multitude of letters we have received from amateur photographers, suggests the value they attach to the assistance we render them by correspondence.

Should you encounter any problems in your photographic work that you cannot readily solve send them to us and we will gladly help you, as we have helped others.

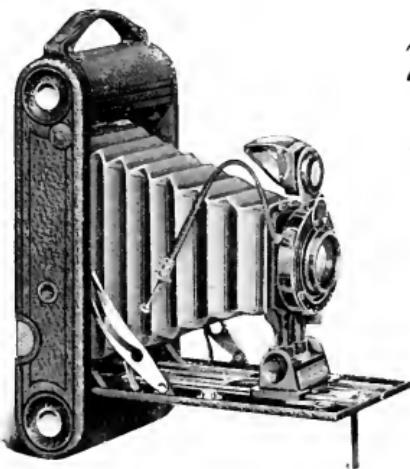
If you have negatives from which you cannot obtain the kind of prints you desire send us both the negatives and the prints, and we will tell you where the trouble lies.

By examining the negatives we can determine whether they were rightly or wrongly exposed and whether they were rightly or wrongly developed, and by comparing the prints with the negatives we can tell whether the prints were rightly or wrongly made.

Give us all the data pertaining to negatives and prints that you may possess, such, for instance, as the month, the time of day, the light conditions when the films were exposed, the stop and shutter speed used, whether the negatives were developed in the tank or in the tray, and the kind of developer with which the films were developed.

We would also like to know the name and grade of paper on which the prints were made. Both negatives and prints will be promptly returned, together with our comments and suggestions, which are offered *free of charge*.

Address all Communications,
KODAKERY, CANADIAN KODAK CO., LIMITED
TORONTO, CANADA



2C

Autographic Kodak Jr.

Picture Size
 $2\frac{7}{8} \times 4\frac{7}{8}$ in.

Price with Single Lens, \$15.50

THE picture is the same shape as the popular post card but slightly smaller.

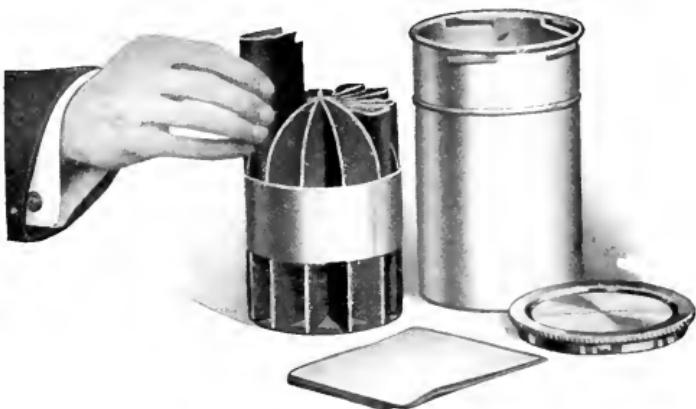
Kodaks for the folks at home mean pictures—cheering pictures—for the boys in France.

The 2C Kodak Jr. is a simply worked, thoroughly capable camera that will make for anybody just the kind of pictures soldiers want.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's

Premo Film Pack Tank



Correct development of negatives is essential to the best photographic result.

The tank method of development is automatic and scientifically exact.

Technical skill is not required with the Premo Film Pack Tank—it is only necessary to follow the simple instructions provided.

Premo Film Pack Tanks and the developing powders occupy such a small space they may be carried without inconvenience, providing the means for immediately verifying exposures when working in isolated localities.

*Ask your dealer, or write us,
for Premo Catalogue.*

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

One of the Kodak Tested Chemicals

Eastman Special Developer

A universal developer, equally successful for plates, film (tray development) and paper. Does not stain the fingers.

Clean and convenient.

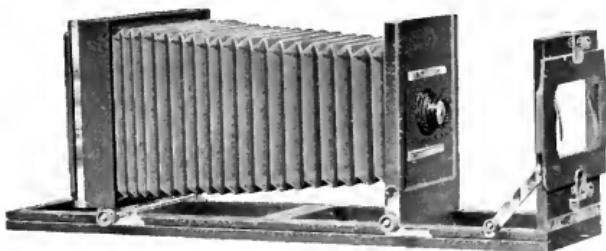
THE PRICE.

Carton of five powders in glass tubes, . . . \$.25
Carton of six powders, paraffin wrapped,25

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's

*Make Large Pictures from
Your Small Negatives*



The Graflex Enlarging Camera

Is equipped with a negative carrier that will accommodate plate or film negatives of any size up to 4×5 or $3\frac{1}{4} \times 5\frac{1}{2}$.

The negative carrier may be adjusted to vertical or horizontal positions, and oscillated or tilted to correct objectionable alignment of the subject in the negative.

Enlargements 8×10 or smaller may be made upon Bromide or Developing Paper either by daylight or artificial light.

Lenses of medium focal length, fitted to Graflex Cameras, may be used with the Graflex Enlarging Camera.

SPECIFICATIONS

Bellows Capacity	- - -	28 in.	Size of lens board	-	$4\frac{1}{4} \times 4\frac{1}{4}$ in.
Length of bed	- - -	36 in.	Weight	- - - - -	$8\frac{1}{4}$ lbs.

Send for Graflex Catalogue.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

Kodak Metal Tripods

are light, compact, rigid,—these qualities are enough, perhaps, but—No. 400 is a pocket tripod—the legs fold flat—



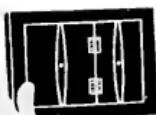
No. 1 has a revolving head so that the camera may be swung from side to side without altering the position of the tripod, itself.

KODAK METAL TRIPODS

THE PRICE

	Sections	Closed	Length	Price
			Extended	
No. 0	3	15½ inches	39½ inches	\$3.75
No. 1C	4	15¾ inches	48⅓ inches	5.00
No. 1	4	15 inches	48½ inches	5.50
No. 400	7	12 inches	49 inches	6.25

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MARCH 1919

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IN THE TRENCHES AT THE MARNE BATTLEFIELD

From a Graflex Photograph by Donald G. Thompson

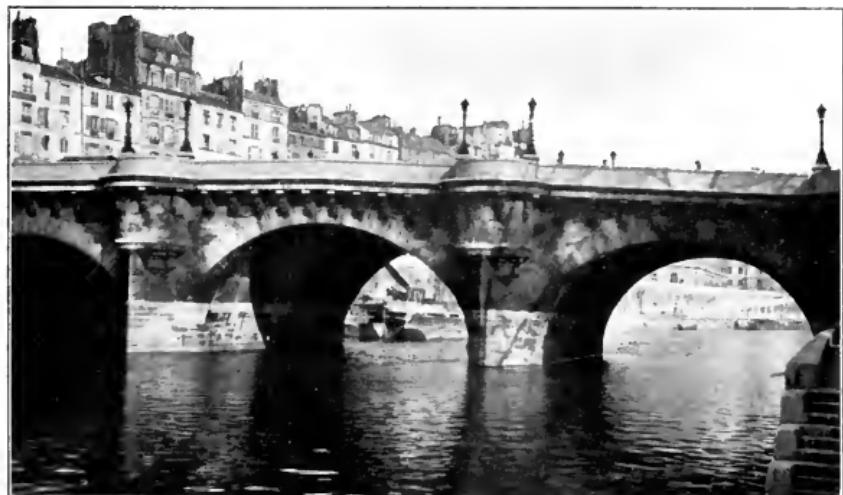


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VOL. VI

MARCH, 1919

No. 5



THE PONT NEUF

Made with 3A Kodak; f.8 stop; 1-25 sec. exposure

PARIS' RIVER

BY ALBERT CRANE WALLACE

THE eyes of the world have turned towards Paris many times in the last four years, but never with greater interest than in the closing days of 1918. Once it was war that gave Paris a solemn, dramatic interest. Then came the days when counsels of peace added a peculiar glamour to the French capital.

Meanwhile, our lads have learned a lot about France and will bring home with them deeply fixed impressions of the land of war. Most of them who have seen Paris have had but brief glimpses. The young women of the Red Cross and other workers in behind-the-lines movements have in many cases been stationed in Paris



BANKS OF THE SEINE IN FLOOD TIME
Made with 3A Kodak; f.16 stop; 1-25 sec. exposure

longer than the individual soldiers.

To all who have seen it in the crisis of war, Paris, always popular with Canadians, is likely to have left a cheerful impression. It has, indeed, been singularly cheerful in the midst of its troubles. Its streets have shown picturesque groupings of men and women from many lands. It has learned to know Canadians better than ever before.

Meanwhile, the Seine has begun to assume again its wonted life. There are no more long distance guns to send shells from concealed locations. The river barges move freely again. The old bridges throng with a livelier procession of humanity.

Personally, I have always had a special affection for the Pont Neuf, shown among the pictures on these pages. It crosses the river near the famous Notre Dame. I saw it first

when I was a youngster, "doing" Europe on \$185. The Latin Quarter side naturally holds the greater fascination. I remember the boats that looked so different from anything I had seen in our Atlantic harbors; and the boat stalls at the brink of the river.

There were no hand cameras in that day. When I came a second time I had my Kodak. What a difference it does make when you *do* have your Kodak! Everything pictorial is accentuated in interest when you can photograph it. And then you can *go back* with your prints without paying another fare.

Surely one of the happy things about an ended war that we may legitimately consider is the restored privilege of taking our Kodak where we choose. When the Kodak is free again men will be free again —there is nothing to hide in a

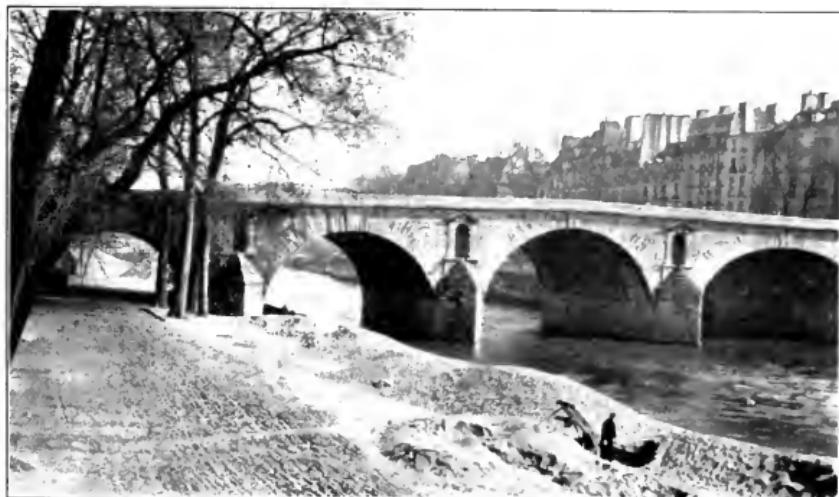


THE SEINE NEAR THE PLACE DE LA CONCORDE

Made with a Kodak, f/11 stop, 1/28 sec., exp. sun.

happy world. Yet the home-coming boys will tell you that the best Kodak pictures that ever happened were those that came to

them in the trenches from "back home." These must always have a place of special honor with the fighting men.



THE MARY BRIDGE

Made with a Kodak, f/8 stop, 1/28 sec., exp. sun.



Fig. 1. Made with Kodak Color Filter; 12 M., December; 1-25 sec.; stop, 16.

DETAIL IN PICTURES OF SNOW SCENES

How to make pictures of snow scenes that will show detail in the snow is a problem we are often asked to solve.

While it is obvious that we cannot get detail in our photograph if there is no detail in our subject—and a level, unbroken mass of clean snow shows no detail on a cloudy day—yet it is equally obvious that we can break up the smoothness of the snow blanket and put detail in it by trampling paths through it.

But the most pleasing pictures of snow scenes are usually made, not on cloudy, but on sunny days, and it is during the hours when the sun is projecting long shadow lines from trees, bushes, tall weeds, etc., across the field of view, and also when, as is shown in Fig. 1

of our illustrations, the snow lies on uneven ground and has drifted into ridges, with the sun shining *across* the ridges, thus producing marked contrasts of light and shade, that pictures of snow scenes showing detail in the snow can be made.

During the first few and also during the last few weeks of winter a heavy fall of fleecy snow is apt to occur, when the snowflakes, being large, cling to the branches and even to the trunks of the trees. The lighter branches of trees and bushes are often borne down under the weight of these clinging flakes.

Such a snowstorm offers opportunities for obtaining pictures that are unique. Fig. 2 represents such a scene, though it does not

show the scene at its best, for the picture was not made until after the sun and the wind had removed the snow from the smaller branches.

The data under Fig. 2 shows that a Kodak Color Filter was used. The sky was blue and the snow on the roof of the small building on the right was white. Through the Kodak Color Filter blue photographs darker than white and it is this difference in tone between the snow and the sky that was needed in this case for outlining the snow-covered roof against the sky.

The exposure for snow scenes, like the exposure for summer scenes, depends on the contrast between the lights and shades of the subject. Fig. 2 represents a scene that contains strong contrasts. The sun was on the left of the camera and the subject contained many dark objects, some of which were wholly and others partly in the shadow of a hill

and also in the shade of trees not shown in the picture. What we wished to record was the lights and shadows on the snow. We cared nothing for shadow detail. This was achieved by giving the same snapshot exposure we would give for a distant landscape in summertime.

Fig. 1 represents a different type of subject—one that receives the direct light of the sky from all sides. In this case we wished to record the shadows on the snow. We did not seek to record detail in these shadows, for there was none. The shadows were merely gray tones on a field of white. It is these shadows that placed the detail in the highest lights—which are on the snow. These conditions are exactly the reverse of those that exist when we photograph a summer landscape with a dark foreground, so we must reverse our summer rule which requires us to "expose for the shadows and let the highlights



Fig. 2 Made with Kodak Color Filter; 2 P.M., early winter; 1-5 sec.; stop, 16



OUCHY HARBOR, LAKE LEMAN

Made with 3A Folding Kodak

take care of themselves," and instead, must expose for the highlights only in order to record the highlight detail. Though Fig. 1 was photographed at noon it was made late in December and it is well to remember that the sun is higher in the sky at noon in March than in December and that the shadows are always shorter at noon than at other hours of the day.

Snow scenes can be photographed with any kind of hand camera. With cameras that have neither the shutter speed markings nor the stop markings we have mentioned use the next smaller stop than the one you use for summer snapshots and make an ordinary snapshot exposure when the Kodak Color Filter is *not* used, but when the filter *is* used, give the same exposure you give with

the same stop you use when making snapshots in summer.



A LARGE FAMILY

Made with Vest Pocket Kodak



IN AN ENGLISH VILLAGE

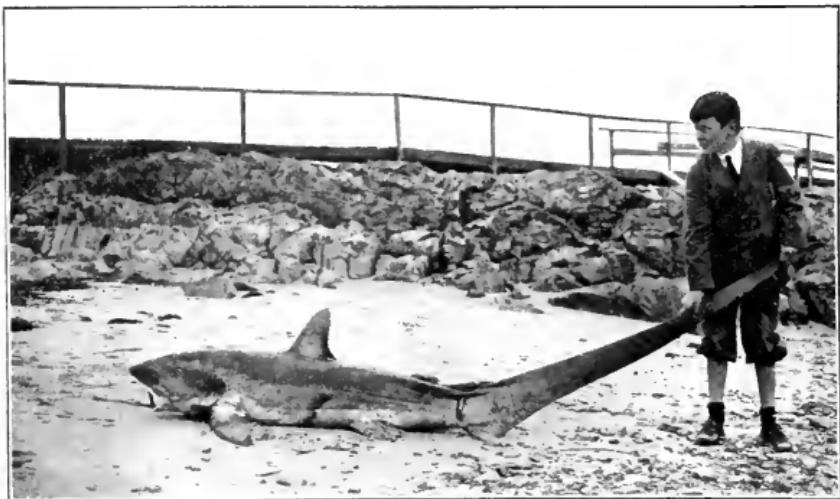
Made with No. 3 Folding Kodak

SPOTTING NEGATIVES AND PRINTS

DUST that remains on a film or plate during development will make transparent (undeveloped) spots in the negative which will make black spots on the prints; while dust on a negative, or on the printing paper at the time

the picture is being printed, will make white spots on the print.

If we keep the inside of our camera, and the changing box in which roll film is transferred to the apron for tank development, free from dust, and our workroom



A HEAVY CATCH
Made with 3A Folding Kodak

and photographic equipment and materials clean, we will find no dust spots on our negatives or prints.

It is evident that a great majority of photographers take the precautions we have mentioned because spots caused by dust are seldom found in the negatives and prints that are sent us for criticism; but it may occasionally happen, no matter how careful we are, that a speck of dust will find its way to a place where it is not wanted, and when this results in a transparent spot in a negative or a white spot on a print these spots can easily be filled in with a bit of pigment from a packet of Eastman Spotting Colors.

Spotting a print is such an extremely simple thing that anyone can do it. A bit of pigment is taken up on the moistened tip of a spotting brush and applied to the

spot that is to be removed from the print. If too much pigment is used it can be taken off the print with a small tuft of damp cotton or with a finger tip, and a lesser quantity applied.

In spotting negatives we must match the tone that surrounds the spot. If too little pigment is used the spot will print too dark and if too much is used it will print too light. To be sure of getting the tone just right the negative must be placed on a sheet of glass—ground glass is the most satisfactory—and the glass held in front of the light so the light will pass through the negative, as it is only by looking through a negative that we can see the depth of the tone that is to be matched.

In order to make the spot match its surroundings and thus become invisible, we must apply just the right amount of pigment, and to be



ONE OF THE HEROINES
From a British Official Photomagazine

sure of doing this a little pigment should be taken up on the tip of the spotting brush and first applied to one of the transparent edges of the negative that is outside the picture area. The pigment must not be wet enough to run freely from the brush but only moist enough so that it can be readily

transferred from the brush to the negative. If the brush makes a deep black mark it holds too much pigment. In this case enough of the color should be removed by gently rubbing the brush on a sheet of white paper until the mark it makes is a pale black. It is better to use too little than too

much color, for if one application fails to make the spot as dark as its surroundings more color can be applied.

With a little practice anyone can spot negatives as well as prints, so no trace of the work can be seen.

The size of spotting brush to use depends on the area of the spot that is to be filled in. A No. 3 brush is suitable for most of the work that is to be done, while for

very small spots No. 2 can be used.

A packet of Eastman Spotting Colors contains black, blue, sepia and white pigments.

White is used for removing spots from white surroundings, sepia is for spotting sepia prints and for blending with black for matching very dark sepia or warm black tones, while blue when blended with black will give a blue-black tone.



THE WAR-TIME DIVER
From a British Official Photograph



SUNDAY SERVICE FROM A BOMB PLANE PULPIT
From a British Official Photograph



RIVER EURE, CHARTRES, FRANCE
Made with a Premo, 1-5 sec.; f.16; Wratten K1 Filter

COLD DEVELOPERS

Do you use a thermometer for testing the temperature of your developer? If not you will be sure to waste material or make poor negatives and prints.

KODAKERY has often explained the necessity for keeping the de-

veloper for prints at about 70 degrees during the whole period of development, and the necessity of knowing the temperature of the developer used for developing negatives in the tank and then developing the negatives for the

length of time the tank instructions recommend for the temperature.

All experienced photographers know that temperature is one of the important factors that affect development. They do not need to be cautioned when cold water comes from the tap; but that beginners in photography are quite apt to use too cold a developer during the first winter they make negatives and prints, is evident from the fact that they send us more under-developed negatives and more poor prints for criticism during the few winter months than during all the other months of the year.

An Eastman Thermometer, made expressly for photographic purposes, will work for your interests at all seasons. It will help to improve the quality of your work and protect you against the waste caused by using too warm or too cold a developer.

Too warm a developer works so quickly that it seldom produces a negative of good quality, and in the development of prints it gives muddy tones.

Too cold a developer cannot fully develop either a negative or a print.

For developing negatives we must keep the developer at a temperature that is between 60 and 70 degrees, (65 degrees is correct) and for developing prints the temperature of the developer should be about 70 degrees. The only way to determine temperature is to test it with an accurate thermometer.



"Lantern Slides, How to Make and Color Them," is the title of a comprehensive little book fresh from the printers that we will send free to anyone, on request.



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Made with g.I Folding Camera

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IN VARIOUS
PLACES
REPORTED
BY
VARIOUS
TYPES OF
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THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES

CHAPTER X—THE TECHNICALLY PERFECT NEGATIVE

In Chapter III (KODAKERY, August, 1918) it was stated that photography is the art of making representations of natural objects, that these representations reproduce the differences of brightness which occur in natural objects, that is, the differences in the amounts of light which are reflected from different portions of the subject, and that in the scenes that we photograph the brightness has a range from the least bright portion to the brightest portion, which may vary from low ranges in which the brightest part of the subject is four times as bright as the darkest, to very extreme ranges in which the brightest part is a hundred times as bright as the darkest. Since the more nearly we can reproduce in our picture the range of brightnesses which were present when the picture was taken, the better the picture will represent the original scene. Our object in photography must be to get an accurate reproduction of the various tones or brightnesses which occur, keeping each tone in its same relative position in the scale as it occupied in the subject which was photographed. This is, of course, easier to do if the range of brightnesses is small than if it is very great.

When we make a photograph we do the operation in two separate steps. We first make a negative upon a highly sensitive material and obtain a result in which all the tones of the original are inverted.

the brightest part of the subject being represented by a deposit of silver in the negative which lets through the least amount of light, while the darker parts of the subject are represented by transparent areas in the negative which let through the most light. This negative is then printed upon a sensitive paper, in which operation the scale of tones is again reversed so that the bright parts of the subject which were represented by heavy deposits in the negative now appear as the light areas of the print and the dark portions of the subject which were transparent in the negative are represented by dark deposits in the print.

In order to find out how closely the tones of the print will follow those of the original subject we must follow the changes of these tones through both steps; we must study first how far the negative reproduces in an inverted form the tones of the subject and then how accurately the printing paper inverts these again to give a representation of the original.

Any silver deposit in the negative will let through a certain proportion of the light which falls upon it. A very light deposit may let through half the light, a dense deposit one-tenth, a very dense deposit one-hundredth or even only one-thousandth. The amount of deposit through which one can see depends, of course, upon the brightness of the scene at which one is looking, but one can see the

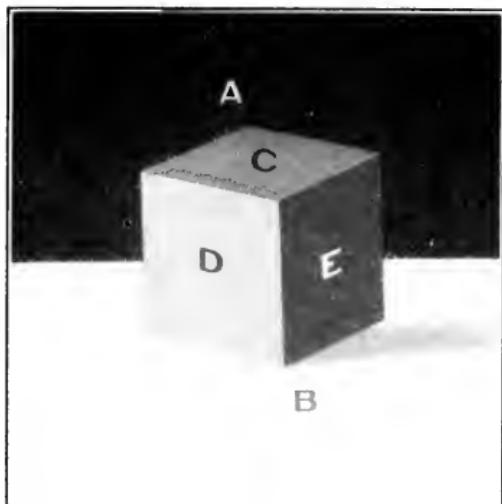


FIG. 1

sum through a deposit which lets through only about one 20,000,-000,000th or one twenty thousand millionth of its light.

These fractions of the light which are let through are referred to as the "transparency" of the deposit, and the inverse of the transparency is called the "opacity," the opacity, therefore, being the light-stopping power of the deposit. A deposit which lets through half the light, for instance, is said to have a transparency of $\frac{1}{2}$ and an opacity of 2. Similarly, one which lets through one-tenth of the light has a transparency of 1-10 and an opacity of 10.

If the negative is to be the exact inverse of the scale of tones of the subject, then the opacities of the different areas must be

in proportion to the brightnesses of the parts of the subject which produce them. In Fig. 1 we have a subject in which if we take the black background as having a brightness of 1, the brightest portion will have a brightness of 10, and the other portion will be in proportion. Then when we make a negative of this we shall get the picture shown in Fig. 2, and in this, if we measure the opacities of the negative, we ought to find them exactly inverse to those of Fig. 1, so that the *transparency* of the background,

A, would be ten times that of the table, B, or the *opacity* of the table, B, will be ten times that of the background, A. Not only this, but the relative opacity of the deposits in the areas C, D and E

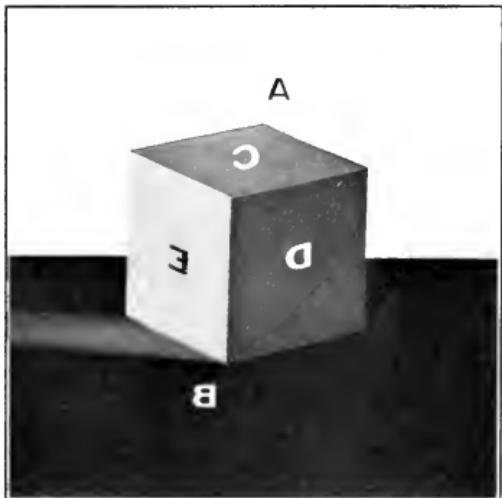


FIG. 2

should also be the same as the brightnesses of C, D and E in the original subject.

It will be seen by the foregoing, therefore, that a technically perfect negative will be one in which the opacities of its different gra-

dations are exactly proportional to the light reflected by those portions of the original subject which they represent.



A NORTH SEA LUMBER BOAT
Made with 3A Folding Kodak



BRITISH MILLGIRL AT WORK

From a British Official Photo-Album



FIG. 1
"Straight print," flat in foreground

PRINTING FOR THE FOREGROUND TONES OF SNOW SCENES

CLEAN snow is one of the whitest things in Nature. It reflects so high a percentage of the light it receives that, when the ground in front of the subject we photograph consists of snow, the strongest lights that are in the field of view will often be in the foreground of the picture.

A picture of an outdoor subject that shows a blank white foreground is seldom pleasing, and when we photograph any object on a snow-covered landscape we should make a print that will record whatever dark tones there may be in the foreground.

A rule in printing that should always be observed is to print so that the principal object of interest will be correctly rendered—neither too light nor too dark in tone.

When we photograph a dark-colored object with snow in the

foreground we will often find (unless we use a Kodak Sky Filter with the yellow part of the filter over the bottom half instead of over the top half of the lens) that the exposure needed for recording detail in a dark object will prove an over-exposure for the snow, and from such a negative the best straight print—that is, a print made by printing from the whole negative for the same length of time—that we can make for obtaining a correct rendering of the object of interest will fail to suitably record the dark foreground tones. Such a result is shown in Fig. 1.

If, on the other hand, we make a straight print that will suitably record the foreground tones the object of interest will be rendered much too dark, as is shown in Fig. 2.



FIG. 2
Background overprinted to bring out foreground tone

The exposure to the printing light was 7 seconds for Fig. 1 and 30 seconds for Fig. 2. Neither print is satisfactory. What is wanted is a print like Fig. 3 which shows the object of interest rendered as in Fig. 1 and the fore-

ground rendered very nearly as in Fig. 2.

Fig. 3 was made by printing through the whole negative for 7 seconds, after which a piece of cardboard was held about half an inch in front of the printing frame,



FIG. 3

so as to prevent the light from reaching any part of the negative above the base of the building. This cardboard was kept moving up and down, from the base of the building to the base of the tree trunks, while the lower part of the picture was being printed for 23 seconds longer. The cardboard was kept moving during the prolonged printing of the foreground so that the foreground would blend into the picture without showing any line between the parts that were

printed for different lengths of time.

By this method the upper part of the picture was printed for 7 seconds and the lower part for a total of 30 seconds, and the result, as shown in Fig. 3, suggests what can be done when printing from any negative that shows detail in snow or clouds in the sky, which cannot be fully printed when making a straight print, without overprinting some other part of the picture.



DISTANT LANDSCAPES

In photographing a nearby landscape we expose for the foreground detail, but in photographing a far distant landscape, by which we mean a landscape view that is a mile or more from the camera, we expose for the distance.

The problem to solve in distant landscape work is the securing of contrast between the tones. The farther away the subject is the less will be the visible contrast between the earth and sky and landscape objects, and the less will be the contrast between the tones in the picture.

Since nearby objects always look larger than far distant objects, their shadows, which appear as dark tones in contrast with lighter ones, will be more prominent, and add more contrast to a picture, than the shadows of far distant objects.

The atmosphere also affects the securing of contrast between the tones in distant landscape work,

The air usually contains particles of dust and more or less water vapor. In speaking of water vapor we do not mean fog or mist, which are composed of comparatively large water particles, but we mean the faint haze that is often seen in the distance and which is largely due to extremely minute water particles.

On a clear summer day the dust and water vapor suspended in the air that is between the camera and objects a few hundred feet away is, usually, too little to be noticed, but that suspended between the camera and objects a mile or more away is often sufficient to be visible as a bluish haze in the distance.

In order to understand why this haze is bluish we must remember that light consists of waves and that the different colors of light correspond to waves of different lengths, the longer waves being red and orange, green being of medium length, and the shortest waves



BRITTANY FISHERMEN

Made with gA Folding Kodak; f.16 stop; 1.25 sec. exposure

being those of blue and violet light. Light waves, which are shorter than violet, are not visible to the eye but affect the photographic film, and the light of these waves is called *ultra violet* light.

Now the light waves which are scattered by the particles are chiefly the shorter waves, that is, the blue-violet and especially the ultra violet. If we remove the shorter light waves, therefore, we shall get rid of most of the scattered light and can take the picture by the green, yellow and red rays which penetrate the haze and are not scattered by it. The shorter light waves are absorbed by a Kodak Color Filter, which cuts out the ultra violet and violet rays so that the scattering effect is largely eliminated. Still more contrast can be secured with a Wratten K2 Filter, as this filter is of a deeper yellow color and cuts out more of the violet and blue.

For special work, such as photographing far distant snow capped mountains against a clear sky, or other very distant scenes in which strong contrast is wanted, a Wratten G Filter, which is a deep yellow contrast filter, should be used.

In photographing distant landscapes we must be careful not to overexpose the film, because overexposure reduces the contrast between the tones. On a distant landscape no tones can be seen that are as dark as the shadows of nearby objects, the shadows on a distant landscape appearing faint and of about the value of the half-tones (the tones between the

light and dark ones) seen in a subject a few hundred feet away.

One-fiftieth of a second through stop 16 is ample for a distant landscape when the sun is shining. The writer has obtained satisfactory results when using stop 16 by giving a 1-10 second exposure with the Kodak Color Filter, a 1-15 second exposure with the Wratten K2 and a 1 second exposure with the Wratten G Filter. In other words, the filter factors used were, 5 for the Kodak Filter, 10 for the K2, and 50 for the G.

It is important to make sure that negatives of distant landscape scenes are fully developed.



The most favorable conditions for photographing falling snowflakes are more apt to exist on mild days in late winter or early spring than at any other time of year, for the snowflakes that fall on mild days are usually larger than those that fall when the temperature is far below freezing.



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If you have negatives from which you cannot obtain the kind of prints you desire send us both the negatives and the prints, and we will tell you where the trouble lies.

By examining the negatives we can determine whether they were rightly or wrongly exposed and whether they were rightly or wrongly developed, and by comparing the prints with the negatives we can tell whether the prints were rightly or wrongly made.

Give us all the data pertaining to negatives and prints that you may possess, such, for instance, as the month, the time of day, the light conditions when the films were exposed, the stop and shutter speed used, whether the negatives were developed in the tank or in the tray, and the kind of developer with which the films were developed.

We would also like to know the name and the grade of paper on which the prints were made. Both negatives and prints will be promptly returned, together with our comments and suggestions, which are offered *free of charge*.

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Eastman Film

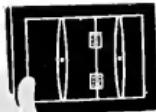
Even a Kodak cannot do its best work unless it is loaded with the film intended for it—the film that is absolutely dependable—Eastman film. All Eastman film is speed film.

If you have a camera in which the Autographic feature is not incorporated, specify Eastman film. If it isn't Eastman, it isn't Kodak film.

If you have an Autographic Kodak or an Autographic Brownie, specify Eastman Autographic Film. If it isn't Eastman, it isn't Autographic.

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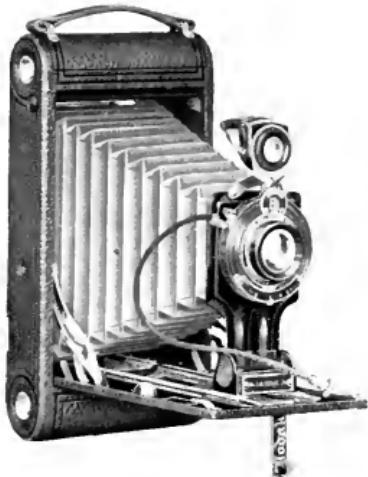
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KODAKERY

A
MAGAZINE *for* AMATEUR
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APRIL 1919

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TORONTO, CANADA.

“KODAK”

is our registered and common-law Trade Mark and cannot be rightfully applied except to goods of our manufacture. When a dealer tries to sell you under the Kodak name a camera or films or other goods not of our manufacture you can be sure that he has an inferior article that he is trying to market on the Kodak reputation.

If it isn't an Eastman, it isn't a Kodak.



If it isn't an Eastman
It isn't a Kodak



IN ARCTIC ICE

Made with gA Kodak. (See pages 16 and 17)



PUBLISHED MONTHLY—YEARLY SUBSCRIPTION, 50 CENTS: SINGLE COPIES, 5 CENTS.

VOL. VI

APRIL, 1919

No. 6



THE HARBOR OF BREST

Made with 3A Kodak; f.22; 1-25 sec..

IN OLD FRANCE

In the northwest corner of France in the Department of Finisterre lies Brest, picturesque and savoring of old Bretagne at every turn. Before the war it was one of the important naval stations of France and its importance has since doubtless greatly increased, for not the least of the vast activities of the Allied

Navies was that of convoying ships. The geographical position of Brest as a base for this purpose must have been ideal.

It has a picturesque harbour and the region surrounding it has always had a fascination for the photographer. In the way of sheer romance this Breton Country is not to be surpassed anywhere. Its



THE COAST OF BRITTANY, NEAR BREST

Made with 3A Kodak; f.19; 1-25 sec.

coast says "pictures" in every direction. Its people are distinctive and its houses quaint.

Fishing is the principal activity of the hardy Breton folk and our illustrations include a picture of

some of their fishing smacks in a harbour close to Brest. Such harbours are frequent all along the coast, and indeed they need to be, for the full fury of Atlantic gales is received here.



MARGAT, NEAR BREST

Made with 3A Kodak; f.16; 1-25 sec.

PHOTOGRAPHIC SILHOUETTES

TEXT FROM
MAY, 1915
"KODAKERY"
ILLUSTRATIONS NEW

A "SILHOUETTE," unless we are using the term as fashion designers use it, to describe the outlines of an effect, usually consists of an uniformly dark image on a light ground. There are, of course, white silhouettes also, though dark ones are usually understood.

As the image in a portrait silhouette is void of detail the attention of the observer is forcibly drawn to its outlines, which are usually characteristic enough to disclose the identity of the person portrayed.

Long before the invention of photography silhouettes were made by tracing the outlines of a shadow on the wall, or on a sheet of paper, and then filling in these outlines



A
TRINKET
*With an Effect
in Trimming*

with dark pigment. Silhouettes were also made by cutting the shadow portraits from black paper with a pair of scissors. This latter method became very popular in the early part of the last century and many of the excellent silhouettes that were made at that time are now preserved in museums. It is interesting, incidentally, to recall that the first sun prints ever made were silhouettes.

Photographic silhouettes can be made by any kind of light that is strong enough for making a negative, but the surest and easiest way of obtaining uniform results is to make the exposures by flashlight in the evening.

Two rooms, with a doorway between, are needed. The doorway

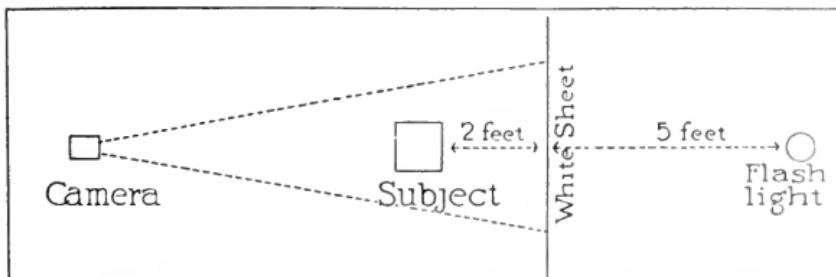


DIAGRAM SHOWING ARRANGEMENTS FOR MAKING SILHOUETTES



A FEATHERED FAVORITE

will be visible when the subject is viewed from the position of the lens.

As shown by the diagram on page 5, the flashlight should be so placed that a line drawn from the center of the lens to the position of the flashlight would pass through the centre of the sheet that covers the doorway.

Just before making the exposure all lights in both rooms must be extinguished and after the shutter is opened the flashlight is ignited, after which the shutter should be immediately closed and the lights in the room turned on again.

In making silhouettes reflections from the walls, pictures and furni-

MAGIC



must be wholly covered with a sheet of white cloth (a bed sheet is excellent) stretched smooth so no wrinkles can be seen. Wrinkles in the sheet will show in the print. The subject and the camera are placed in one room and the flashlight in the other. The subject is posed before the sheet, facing at a right angle to the camera. The face should be in full profile, so not even the lashes of the eye nearest the sheet



DOMESTIC IRRIGATION



DISCIPLINE

ture should be avoided. A doorway near the corner of a room is not suitable, unless the wall paper is very dark. White or light-colored costumes are also less suitable than those that are dark.

The negatives must be contrasty, so nothing but the shadow-like image of the subject will show in the print. Contrasty negatives will be obtained by developing the films in the Kodak Film Tank for fifteen minutes, with two Tank Developer Powders, used at a temperature of 65 degrees. Tray developed negatives will be contrasty if developed with a double strength developer, until the background (as seen from

the back of the negative) is blackened to the base of the emulsion.

The lower part of a silhouette negative should usually be masked in printing. The mask may be made of any kind of opaque paper, cut or torn to the shape desired. The mask may be laid between the printing paper and the negative, or held over the back of the negative during printing.

Opaque may be applied with a spotting brush (both of which may be had of Kodak dealers) on the back of the negative, for blocking out the image of anything that may show in the negative outside the area covered by the sheet.

The outlines of costumes and accessories may also be modified by this method, if desired.

Silhouettes must be printed on contrasty paper, like Contrast Velox. Soft paper, like Special Velox, is not suitable unless the density of the background is extreme.

When the subject is placed two feet from the white sheet and the flashlight is ignited five feet behind the sheet, with the lens stopped to *f*.8 (U.S. 4) the following table will indicate size of flash sheet to use with the various sizes of cameras listed:



15 $\frac{1}{8}$ x 2 $\frac{1}{2}$	2 $\frac{1}{4}$ x 3 $\frac{1}{4}$
1 No. 1 Eastman	Flash Sheet.
2 $\frac{1}{2}$ x 4 $\frac{1}{4}$	3 $\frac{1}{4}$ x 5 $\frac{1}{2}$
3 $\frac{1}{4}$ x 4 $\frac{1}{4}$	4 x 5
1 No. 2 Eastman	Flash Sheet.
4 $\frac{1}{4}$ x 6 $\frac{1}{2}$	5 x 7
1 No. 3 Eastman	Flash Sheet.



A HOLLAND WINDMILL
Made with No. 3 Folding Kodak

SEPIA PICTURES BY RE-DEVELOPMENT

Of the various methods that have been employed for making sepia photographs the sulphide process of converting the black silver image of a development paper print into one of a sepia tone is one that is most extensively used at the present time.

The most satisfactory method of sulphiding a development paper

print is to redevelop it, because by this method no reduction of the image occurs and none of the detail of the picture is lost.

Pleasing sepia prints can be made from any negative that has strong highlights and deep shadows, but the richest sepias are obtained from negatives that have a long range of tones. When a sepia print is made from a long



A BALKAN STREET, VODINA
From a Kodak Photograph by Merle Laloy

scale negative it will usually show more distinct tones than can be seen in a black image print made from the same negative.

The shade of sepia obtained by turning a black image into one of a sepia tone depends on the thickness of the silver deposit, being dark where the silver is thick and light where the silver is thin, and the reason why the sepia image often shows more tones than the black one is that a slight difference between the tones of sepia is more noticeable than a slight difference between the tones of black or gray.

The richness of the sepia tone depends on the quality of the black image that is re-developed. This image must be either a pure black or a blue-black, not a greenish or brownish black, and in order to obtain the right kind of a black image the print must be exposed to the printing light for the minimum length of time that will re-



PINE ROAD IN THE ROCKIES
Merle Laloy West Park, Colorado

cord all the detail, and then be fully developed—not less than 20 seconds if it is on Regular Velox, or less than 30 seconds if on Special Velox—so that all the silver on which the light has acted will be blackened.

The ideal developer for Velox prints that are to be converted into sepia is Nepera Solution, as this will give the right kind of a black image. The Elon-Hydro developer recommended for Velox will also give good results if it contains the least quantity of bromide that will prevent the print from fogging

during development. Too much bromide gives the greenish or brownish black images from which good sepia tones cannot be obtained.

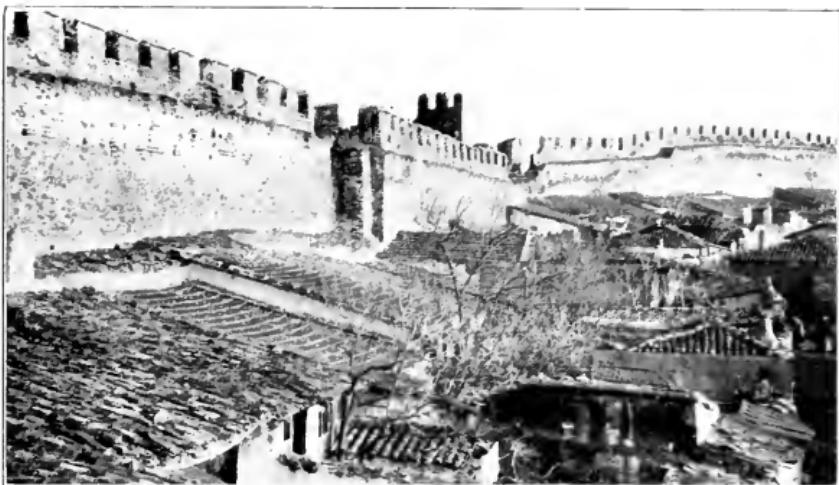
An over-printed and under-developed print may sometimes be pleasing in black but it is never pleasing in sepia because there is too little blackened silver in the shadows of such a print to make the shadows dark enough when the image is changed from black to sepia.

The method of re-developing a print with the Velox Re-developer is in every way as simple as developing the black image. The print is immersed in the bleaching bath and left there until all traces of black in the image have disappeared. When this has occurred the picture can be but faintly seen. It is then rinsed in water and placed in the sulphide bath, where the image, with all its original detail, is rapidly changed into a permanent sepia tone. Full directions for working the process are furnished with every package of Velox Re-developer.

All grades of Velox, excepting Glossy, are suitable for making sepia prints. Carbon, Portrait and Velvet Velox will give us sepia pictures on a white ground, while with Royal Velox we can make sepias on a cream-tinted ground, a combination that is especially pleasing.



FOOD DISTRIBUTION
Made with No. 2 Bromine



THE WALLS OF SALONIKA
Made with 3A Kodak, by Merle LaVoy

CLEANING LENSES

It takes a brilliant negative to make a brilliant print, and such a negative can only be obtained with a clean lens.

By viewing an outdoor scene through a clean and then through a foggy pane of window glass you will discover what a foggy lens will do to your pictures.

All glass, whether it is the kind used for making window panes or the kind used for making lenses, becomes coated with a filmy deposit on prolonged exposure to the atmosphere. This is due to various causes, but the one that can most easily be observed is the condensation of moisture on window panes which, on drying, makes the glass look dirty or foggy.

When a camera that has been out in the cold is taken into a warm room it should be kept closed for several minutes, so that the tem-

perature of the lens will change slowly and none of the fine dust which is ever present, though it may be invisible, in living rooms, will become attached to the lens by condensing moisture.

Lenses do not condense moisture when they are suddenly taken from a warm room into the cold outdoor air in winter. Condensation only takes place when the condensing surface is *colder* than the air in which the moisture is suspended.

Since it is during the cold months of the year that lenses are exposed to great changes of temperature, it is best to examine them often during that time.

The first thing to do toward cleaning a lens is to remove any dust which may have settled on it. Use a camel-hair brush for dusting. This is important, as removing dust from a lens by rubbing it with a

cloth or with a stiff brush will be apt to scratch it.

After the dust has been removed breathe on the lens and wipe it with a clean, well-worn linen handkerchief which has been made soft by repeated laundering.

Never clean a lens with alcohol or any kind of acid, and never use any kind of polishing preparation on it.

The fingers should never come in contact with the surface of the lens at any time.

It is not often necessary to take a lens out of the shutter or the barrel in which it is mounted, as it is only the outer surface which is apt to become foggy, but if both the inner and outer lens surfaces do need cleaning be sure to remove and replace one combination before removing the other. If the combinations of some types of lenses—especially some of the high-grade anastigmats—are trans-

posed, so that the front combination is placed where the back one belongs, and the back combination is placed where the front one belongs, the lens will be useless until the combinations are placed where they should be.

Never remove a lens from its cell (the metal rings that hold it), for if this is done the lens may have to be sent to the makers for repairs.

Single lenses that are mounted behind the shutter are usually built into the camera, so they cannot be removed. They can be cleaned with a piece of handkerchief wrapped around the head of a small pencil-shaped brush after the shutter has been opened as for a time exposure.

Since foggy lenses make foggy looking negatives and since it takes a clean-cut negative to make a clean-cut, brilliant print, it is important that you should keep your lens clean.



AN ALPINE VISTA

Made with a Kodak



JACK IN CAMP
Made with a Kodak

KODAK IM FROM THE



PRESSIONS E ARCTIC



THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES

CHAPTER XI—THE CONDITIONS FOR PRODUCING A TECHNICALLY PERFECT NEGATIVE

IN the last chapter of this series we saw that a technically perfect negative is one in which the opacities of its different gradations are exactly proportional to the light reflected by the portions of the original subject which they represent. Let us now consider how far we can fulfil the condition

each step is twice the brightness of the next step, the light let through each step of the negative should be half the amount of the step next to it. This would be attained if each step in the negative added the same amount of silver to the deposit, so that if we could represent the silver for each step as altering the thick-



FIG. 1

and what must be done to obtain such a perfect negative of any subject.

Suppose that a photographic plate or film is exposed to a series of known brightnesses; for instance, that we photograph a scale made up of steps of different reflecting powers so the brightness of each step is doubled with regard to the next one. We should get a negative which would look like Fig. 1.

Now if the rendering is technically perfect, the opacities of this negative should be the same as the brightnesses of the different steps of the original; that is to say, as

ness of the silver deposit (it does not do this really, of course; it adds to the number of grains in the same layer) and then could cut an imaginary section through the negative so as to show the height of the deposit of silver, it should look like Fig. 2; and if we draw a diagram in which the amount of silver is represented by the height of a vertical line, the diagram showing the amount of silver for the different steps might look like Fig. 3.

If we actually try this experiment, however, we shall find that the silver does not rise quite uniformly in this way as the exposure

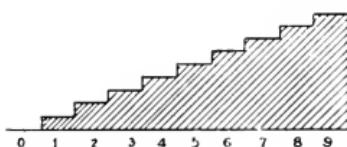


FIG. 2

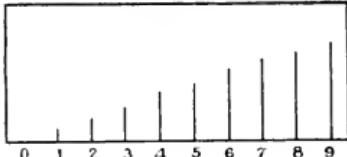


FIG. 3

is increased through the entire scale, but that instead we get the diagram shown in Fig. 4, and this diagram, which represents the actual relation between the silver deposit in a photographic material and the increase of exposure, requires careful study.

Starting at A and proceeding to B we notice that at the beginning, in the lower exposure, the steps are marked by a gradually *increasing* rise, and, therefore, in this part of the exposure scale there will be *too great* a gain in opacity for each given increase of exposure. A negative, the gradations of which fall in this period, will yield prints in which an increasing contrast is shown between tones of uniform increase of brightness; that is to say, it will appear what we term "under-exposed." From this period at B we pass imperceptibly into the period where the densities show an equal rise for each equal increase of exposure, and here we have our technically perfect negative, that is, one in which the opacities are exactly proportional to the light intensities of the subject. This is termed the "period of correct exposure," and only through this period of the curve where the opacities are directly proportional to the exposures and where the densities show an equal increase each time the exposure is doubled shall we get a perfect rendering of the original subject. From the point C onwards we have a gradually *decreasing* rise in the steps with increase of exposure until, finally, the increase of density with further exposure becomes imperceptible. This period is the period of "over-exposure,"

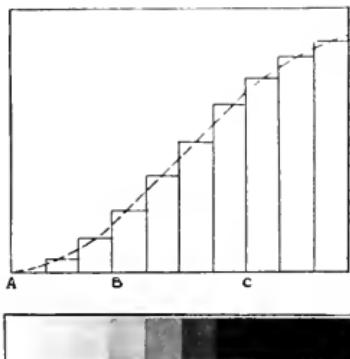


FIG. 4

in which the opacities of the negative fail to respond to increasing amounts of exposure and the correctness of rendering is again lost. It will be seen at once, then, from this curve that only through the period of correct exposure where equal increases of exposure are represented by equal rises in density can the tones of the original subject be correctly reproduced in the print.

If we join all these points together instead of representing them as a staircase effect, as is shown by dotted line in Fig. 4, we get a smooth curve, Fig. 5, of which the straight line portion (B to C) represents the period of correct exposure, while the more or less curved portions at the beginning

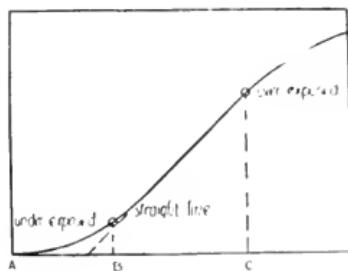


FIG. 5

and end of the curve correspond to the periods of under-exposure and over-exposure.

It must be realized that no ordinary negative can show the whole range of exposures from beginning to end of this curve. This is because the range of brightnesses covered by the whole curve is much greater than that which occurs in ordinary subjects and consequently it is quite possible to represent an ordinary subject entirely in the period of correct exposure, avoiding both the period of under-exposure and the period of over-exposure. If, therefore, we wish to obtain a technically perfect negative, we must expose so that the subject which we are photographing falls into this period of correct exposure, when we shall obtain a negative in which there will be no wholly transparent film, since this would

mean that we had entered the period of under-exposure, and there will be no blocked up masses of silver since this would mean that the negative was over-exposed. The capacity of a photographic material to render the scale of tone values correctly is, therefore, entirely a matter of the length of the straight line portion of the curve, and it is the length of this straight line portion in the case of Kodak film which gives its well-known "quality" to the material. By the use of a material of this kind which has a long, straight line portion to the curve and of an exposure which will place the scale of intensities on that straight line portion we can correctly translate the tones of the subject into corresponding opacities in the negative and obtain a technically perfect negative.



PHOTOGRAPHING SPRING FOLIAGE

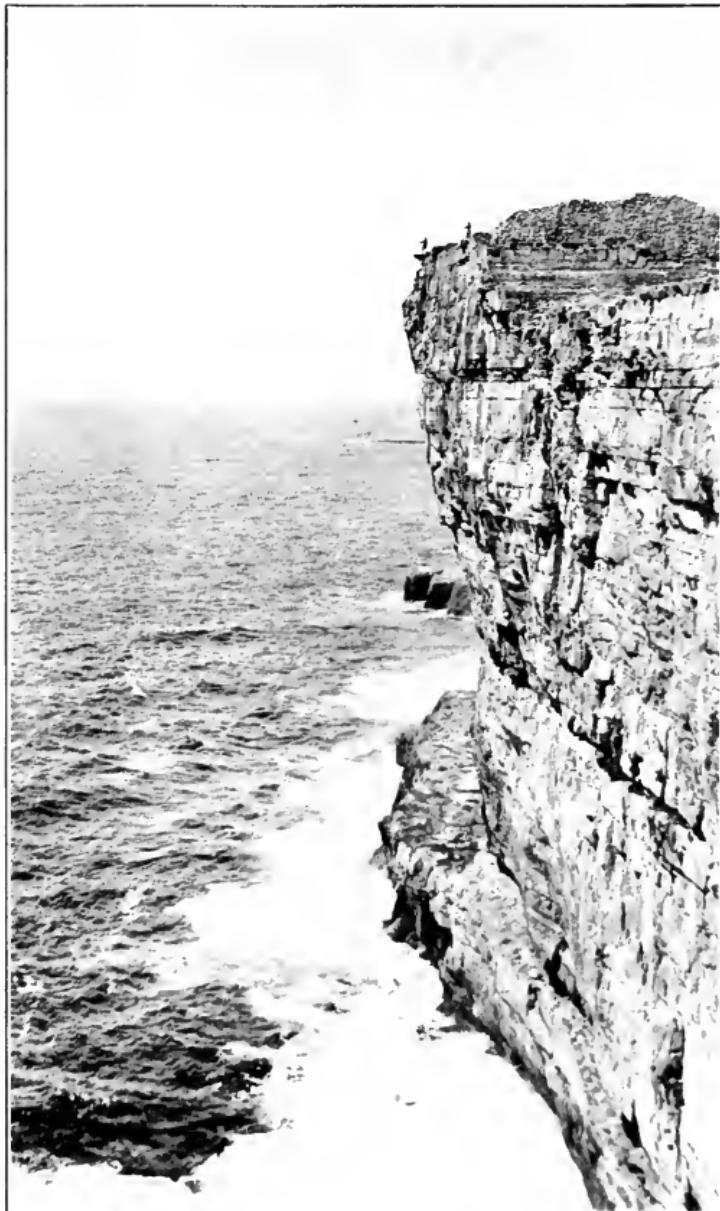
NATURE is never more beautiful than during the early Spring; the brilliant green of new foliage gives a freshness and brightness to the landscape which is not present at other seasons. As spring advances and merges into summer most of the leaves assume a deeper color, which is maintained until they commence to turn brown in the Fall.

Landscape pictures made in the ordinary way, which include any considerable amount of spring foliage, will reproduce this foliage in too dark a tone, because the light reflected from the young leaves and

twigs is rich in those light rays which strongly affect the eye, but weak in those actinic rays which will record themselves on the film.

As we cannot change the character of this light, we must, to obtain proper rendering of the picture, hold back the more actinic light which is reflected from other parts of the subject, until the less active light rays have been given an opportunity to record themselves.

A non-orthochromatic film would be sensitive to blue, violet and ultra-violet light only and if light of these colors were prevented



NATURE'S IMPREGNABLE BARRIER
Made with a Kodak



STUDIO INTERIOR
Made with a 3A Kodak

from reaching the sensitive surface, hardly anything would be recorded. Eastman Film, however, being orthochromatic, is sensitive to green, so that by filtering out and greatly subduing the strongly active blue and violet rays, we can, by giving sufficient exposure, obtain good printing density in those parts of our film which would otherwise

have been almost unacted upon.

This process of filtering out the chemically active light rays is simply accomplished by making the exposure through a Kodak Color Filter, which is carefully adjusted to stop practically all the ultra-violet light and only allow a portion of the blue and violet light to pass. Obviously the exposure will now be made to those rays which have, comparatively, a weak action on the sensitive emulsion, so that the length of exposure must be increased. For ordinary landscapes an exposure ten times as long as would be needed without the filter should be given. Thus if $1/50$ of a second is correct without the filter, give $1/5$ of a second when the filter is used.



"Time" or "Bulb" exposures cannot be made with the Kodak Self Timer, but it will automatically press the cable release and operate the shutter (after the lapse of time for which it has been set) throughout the range of mechanical or "instantaneous" speeds.



A CAMOUFLAGED GUN
Made with a Kodak by Merle LuUe



Positive Print from an Ordinary Negative

DEVELOPING FOR A NEGATIVE AND GETTING A POSITIVE

AFILM is exposed in the camera for the purpose of obtaining a negative image of the subject that was photographed, and if the film shows a positive instead of a negative image after it is developed it is because reversal of the image has taken place.

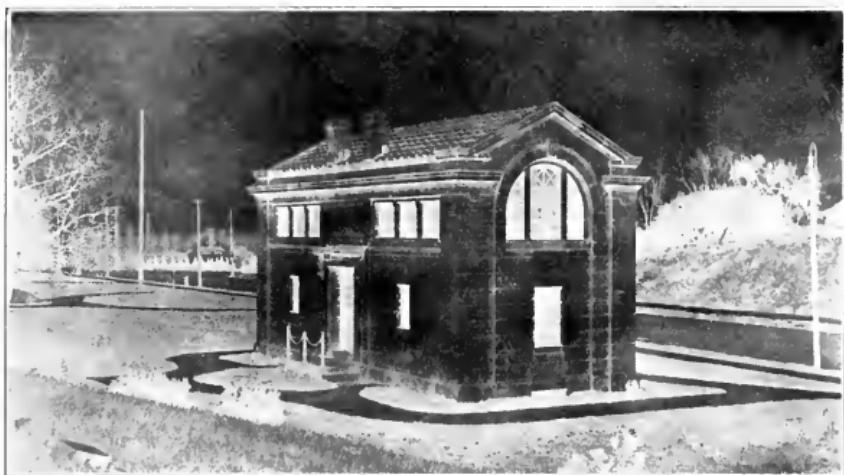
Reversal is sometimes, though very rarely, caused by just the right amount of excessive over-exposure while the subject is being photographed. It may also be caused by the presence of hypo in the developer, but this seldom happens, as hypo in the developer is more apt to produce green fog than a real reversal of the image.

Actual reversal is most frequently caused by exposing a partly developed negative to actinic light (light which affects silver emulsions), and then fully developing the negative after it has been so exposed.

Exposing a film or a plate to actinic light between the time when it was removed from the camera and the time when it was placed in the developer produces, not a reversal of the image, but what is known as a light-struck negative, which will turn black all over during development.

The illustration on page 25 represents a print made from a negative that was reversed by developing the film until the negative image became faintly visible in all its parts, and then exposing the film for two seconds at a distance of three feet from a sheet of opal glass (used for subduing the light), behind which, enclosed in a box, was a 60 watt Mazda lamp. After the partly developed film was thus exposed it was again placed in the developer and fully developed.

When reversal is caused by light



Print from a Film that was Changed from a Negative to a Positive During Development

acting on a film or plate during development the entire surface of the negative becomes fogged, but underneath this fog lies the positive image from which none but a negative print can be made.

If the room in which negatives are developed is not wholly light-tight, so that light can enter the room through a small opening from which it will reach the negatives after development has begun, or if the room is wholly light-tight and the negatives are exposed to the light of unsafe darkroom lamp while they are developing, a partial or a complete reversal of the image is sure to occur.

The safety of a darkroom can quickly be determined. By remaining in the room for a few minutes after it is closed, when all the lights in the room have been extinguished, we can readily see if any outside light is entering. If any light can be seen the openings through which it comes should be closed.

After the darkroom has been made light-tight the safety of the light coming from the darkroom lamp can be determined by placing an unexposed film in a tray containing developer and keeping it there, at the same distance from the darkroom lamp, for the same length of time that a negative would be if it was being developed, and then placing it in the fixing bath. If the film is clear after it is thoroughly fixed the light is safe, but if it shows fog the light is not safe.

Eastman films are orthochromatic and are consequently sensitive to green and yellow as well as blue and violet, and because of this fact they should not be exposed to any but a ruby light, or a light that is a combination of ruby and orange, during development.

It should be remembered that no light, no matter what its color or how dim it may be, is absolutely safe, for any kind of light will fog

a film or plate if it is allowed to act long enough.

For this reason negatives should not be developed very close to any darkroom lamp. While negatives are developing in a tray the tray should always be kept 18 inches or farther from the lamp and while the negatives are developing they should not be taken from the tray and held close to the lamp for

examination more than a few moments at a time.

The safest place to develop films and plates is in a tank. It is wholly impossible for light to either fog or reverse the images in negatives while they are developing in Eastman Film or Plate Tanks, as these tanks are fitted with covers which make them practically air-tight and absolutely light-proof.



WINTER SPORT

Made with a Kodak

WHEN IN NEED OF ASSISTANCE

"I have always received so much help from KODAKERY when I was in trouble, I venture to seek aid for a friend."

THIS extract, from one of the multitude of letters we have received from amateur photographers, suggests the value they attach to the assistance we render them by correspondence.

Should you encounter any problems in your photographic work that you cannot readily solve send them to us and we will gladly help you, as we have helped others.

If you have negatives from which you cannot obtain the kind of prints you desire send us both the negatives and the prints, and we will tell you where the trouble lies.

By examining the negatives we can determine whether they were rightly or wrongly exposed and whether they were rightly or wrongly developed, and by comparing the prints with the negatives we can tell whether the prints were rightly or wrongly made.

Give us all the data pertaining to the negatives and prints that you may possess, such, for instance, as the month, the time of day, the light conditions when the films were exposed, the stop and shutter speed used, whether the negatives were developed in the tank or in the tray, and the kind of developer with which the films were developed.

We would also like to know the name and grade of paper on which the prints were made. Both negatives and prints will be promptly returned, together with our comments and suggestions, which are offered *free of charge*.

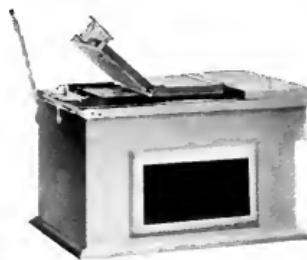
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Toronto, Canada.



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Price \$2.75 up



Kodak Amateur Printer
Price \$7.50

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Film Tank—
Print with the Kodak
Amateur Printer and
derive *all* the pleasure
that photography pro-
vides.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's.



The Pocket Premo

EXTREME compactness, rapidity, and simplicity of operation are especially featured in this attractive little camera.

Focusing or estimating of distances is not required—with one movement, the front is drawn down and the lens locked rigidly in position for instant use.

Open the back, drop in the Premo Film Pack, draw the safety cover, and the camera is ready for the first exposure.

The camera may conveniently be carried in the pocket.

*Ask for the 18-page Premo Catalogue, free
at your dealer's or by mail.*

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA



Kodak Color Filter

Renders the greens and yellows much lighter than they would be rendered without the screen—the tones will correspond to the brightness of these colors as the eye sees them.

The clouds will also show in the final print.

Prices range from 50c. to \$1.00

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA



*See the Picture
before you Snap It*



The Graflex Camera

Lets your eye see what the lens sees, *before the exposure is made*, and right side up.

You watch the subject upon the full picture size ground glass screen, adjusting focus and composition until the image grows clear, and sharp—then snap it.

The Graflex Focal Plane Shutter may be adjusted for any class of photographic work, from time exposures indoors, to a speed that will clearly reproduce subjects moving with great rapidity.

There are many models of Graflex from which to choose a camera suitable for your work.

*Ask your dealer or write
us for Graflex Catalogue.*

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

Pictures that are Worth the Taking are Worth the Keeping



In these stirring times pictures should be carefully treasured. Loose prints are eventually lost prints—keep them in an Album.

The Balmoral Album illustrated above has a rich and distinctive appearance—yet is built to wear. Made on the loose leaf principle.

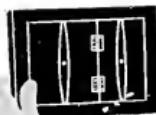
The Westminster is a similar Album but covered with imitation leather, while the Glendale is cloth covered.

THE PRICE

		A $5\frac{1}{2} \times 7$	B 7×10
The Balmoral Album	- -	\$2.50	\$3.50
The Westminster Album	- -	1.50	2.00
The Glendale Album	- -	1.25	1.75
Extra leaves, per package of 12		.18	.25

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's.



It's better to use

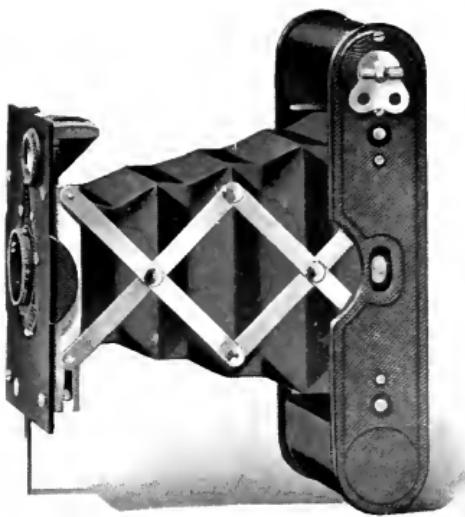
VELOX

A photographic paper that fits
every amateur negative.

CANADIAN KODAK CO., LIMITED
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At your dealer's.

Price,
\$8..50



Pictures $1\frac{5}{8} \times 2\frac{1}{2}$ inches

VEST POCKET AUTOGRAPHIC KODAK

Small enough for the vest pocket—big enough for the opportunity.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's

KODAKERY

A
MAGAZINE *for* AMATEUR
PHOTOGRAPHERS



MAY 1919

CANADIAN KODAK CO., LIMITED.
TORONTO, CANADA.

SAFELIGHT LAMPS



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It isn't a Kodak



GIRL GUIDES AT SIGNAL WORK
From a British Official Photograph

KODAKER Y

A Journal for Amateur Photographers

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No. 7



BRITISH TROOPS MARCHING INTO LILLE

THAT "WELL-IT'S-OVER" SMILE

BY ALBERT CRANE WALLACE

Illustrated with British Official Photographs

THAT smile—that “Well-it’s-over-at-last!” expression—really began before the fateful day when the armistice was signed. It began when the great tide of war turned.

You “get” it in pictures made during those early fall days when the end of the vast drama began to shine very clear.

To be sure, there was no time—even in the crisis of the worst of

tragedies—when you could not find grinning Tommies, Poilus, and Doughboys. Those plucky youngsters (and oldsters with them) had a way of laughing in the very face of death. It was magnificent to see their look, and to hear them sing, when the orchestra of guns was playing a thrilling crescendo, and the sky was all aglare with war.

But when the consciousness came that victory was just ahead



GRINS IN ENEMY HATS

there was no mistaking that exultant joy-look. It was no longer feverish, no longer defiant, no longer a mere emotional mood. It was downright gladness growing out of a vast relief. It was a letting down of the strain.

The playful spirit is strong among soldiers, when you take them in a group. Every wise commanding officer knows how to encourage this tendency. A soldier who did not laugh, or sing or play would soon wear out.

The boys who came to the relief of Cambrai found there a great stock of brand new German helmets, which by official guess were to be worn when the Teutonic armies should make their triumphal entrance into Calais. Of course, these were tried on, and a British

official photographer caught a group of Tommies rigged out in these shiny headpieces and unanimously grinning their delight at the paradox of the thing.

Going forward to victory became a laughing matter. Why not? Rough work, mind you, still to be done. Hard work coming, even after the stoppage of hostilities. But pains and aches no longer counted when the goal of honest peace was in sight.

You cannot blame a photographer for catching smiles wherever he may find them. In those terrible early days I found the photographer watching for those smiles. He seemed to need them himself, and he knew very well, whether he was an official person or "on his own," that the smile would



"IT'S GOING OUR WAY!"

be reassuring to the world behind the lines.

Smiles were easy to find after November 11th—though the first grins were a bit bewildered and incredulous. It was hard to believe that it was over. Maybe there was something behind those first "Well, it's-over!" smiles that no camera could record.

Then came the going home smile to end with the best of all—"Home Again!"

We shall be watching these for many a day.



Use a tripod for time exposures.



HITTING UP THE MUSIC



PROTECTION

THE SURFACE OF THE PRINTING PAPER

VERY frequently we are asked to advise on the surface of Velox or other paper most suited to a particular negative and nearly always special reference is made to the negative being thin, heavy or under-exposed, as the case may be. In other words, there seems to be an impression that the *contrast* of the negative should have great influence in the selection of the *surface* of the paper on which it is to be printed.

While to some extent the surface of the paper may affect the contrast of the print, surface should, generally speaking, be chosen with reference to the character of the subject and the purpose to which the print will be put.

Velox Paper, the standard of its type, is divided into three grades of contrast—Special for strong and average negatives, Regular for negatives somewhat lacking in contrast and Contrast for thin or flat negatives. We must first decide which of these grades our negative requires on account of its scale of gradation and next what surface to choose to suit the subject. There are four principal surfaces known as Glossy, Velvet, Carbon and Portrait. Glossy is made in Regular and Special. Velvet in Regular, Special and Contrast. Carbon in Regular and Special, and Portrait in Special. In addition there is Royal Velox which has a rough surface with a slight lustre and is



IN THE SUEZ CANAL

coated on Buff colored stock. It is made in Regular and Special.

If our picture possesses a great deal of fine detail, especially in the shadow portions, it will show most plainly if we use a glossy paper. On the other hand there may be too much detail, so much that it distracts the eye from the main object in the picture. In this case Carbon, which has an absolutely dull surface, is indicated for the shadow detail will be much subdued.

Portrait Velox also has a dull surface but is extremely smooth and therefore well suited to Portrait work as its name implies, but it can often be used to great advantage for landscapes. Royal Velox is specially useful when the print is to be subsequently re-developed to a sepia color.

Finally there is the Velvet sur-

face, which is midway between glossy and matte. It has many of the advantages of glossy in so far as the rendering of detail is concerned, and yet does not possess that extreme gloss which to many is objectionable.

A still higher glaze is often given to a Glossy Velox print by squeegeeing it on to a ferrototype plate, and such prints are usually insisted on for all press and reproduction work, as the utmost amount of detail is thereby shown. In this last instance the surface has been chosen with reference to the purpose to which the print is going to be put, without regard to the character of the subject. In all cases when it is desirable to portray the subject in an artistic manner and to the best advantage, a surface of paper ought to be selected which harmonizes with the subject.



GOSSIP

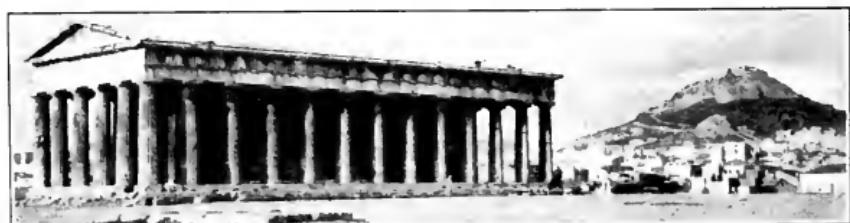
A USEFUL ATTACHMENT

NO T every Kodak enthusiast realizes the great advantage on many occasions to be obtained from the use of the simple, inexpensive portrait attachment. Slipping on over the lens mount or into the front board of the camera according to the pattern of the instrument, its mission is to so modify the focal length of the camera lens that the combination will be shorter than it was originally.

The result of this modification

is that objects which would previously have been out of focus because they were too close to the camera will now be in focus, if placed according to the instruction sheet, at the correct distance, when the focusing scale is set to a given point.

Portraits, pictures of pets, flowers and still life, and, in fact, all close-ups, can be recorded with the aid of this unobtrusive accessory, and with the greatest ease.



THE PARTHENON AT CRETE
Made with a Folding Kodak



SAILING DAYS ARE COMING

Made with a Kodakina Kodak.

ENLARGING FROM VEST POCKET KODAK NEGATIVES THE EASIEST WAY

BY B. F. QUISENBERRY

Do you realize how easy it is to make a post card size picture from your Vest Pocket Kodak Negatives? The Vest Pocket Kodak Enlarging Camera has made it about as simple for us as making contact prints.

This enlarging camera is of the fixed focus type, and it is to the making of enlargements what the printing frame is to the making of contact prints, the only difference in the two processes being that in the printing frame the sheet of photographic paper is in contact with the negative, while in the enlarging camera the paper is in one end of the camera and the negative in the other end, with a lens between the paper and the negative, so that the light passes first through the negative and then through the lens, which projects an enlarged image of the negative to the paper.

With the Vest Pocket Kodak Enlarging Camera enlargements can be made on bromide or Velox paper according to the user's choice or as may be indicated by the character of the negative. Special Velox tends to give slightly more contrast than Bromide Paper and this fact can be taken advantage of when enlargements are to be made from negatives which require Regular Velox to yield good prints. When dealing with thin negatives Regular Velox can be used for the enlargement.

In use the camera is placed in the shade (never in sunshine) with the end of the camera that holds the negative pointed toward the sky.

In making enlargements it is necessary that the negative be uniformly illuminated, for if it is not, some parts of the enlargement will be either lighter or darker than they should be. To insure a uniform illumination the enlarging camera must be placed where it will receive the unobstructed light from the sky. This cannot be obtained if the camera is in a position where some of the light is cut



*Actual Size of Picture made with
Vest Pocket Kodak*



*Actual Size of Picture the Vest Pocket Kodak Enlarging Camera
makes from $1\frac{1}{8} \times 2\frac{1}{2}$ negatives*

off by the eaves of a building or the branches of a tree.

The exposure needed for making enlargements depends on the density of the negative, the strength of the light and the kind of paper used, bromide paper requiring a much shorter exposure than Velox. The contact print and enlargement shown on the preceding pages were both made on Regular Velox from a fully developed negative. The exposure for the enlargement was 20 minutes to a clear sky on a sunny day in the shade of a building.

When enlarging on Velox the camera may be loaded and the enlargement developed in the sub-

dued daylight of an ordinary room, when all doors are closed and all window shades are drawn down, but bromide paper, which is much more sensitive to light than Velox, must be handled in a darkroom, in a red or an orange colored light.

With a little practice one can make post-card size pictures from Vest Pocket Kodak Negatives as cheaply as contact prints can be made from post-card size negatives.



THE COUNTER SIGN

There's but one pass word when you want the best in photography
—*Kodak*.



RURAL SCENE IN THE BALKANS

Made with a 3A Kodak, by Merle LaFoy



MAIN STREET OF AMIENS, FRANCE, AFTER BOMBARDMENT

STILL ON THE MAIN STREET

SELLING anything in certain parts of Northern France was naturally a complicated matter during upward of four years, and selling Kodaks did not escape the

complication, as the vivid picture here shown may well remind you.

The picture shows part of the main street of Amiens as it appeared after bombardment. At the

right of the picture may be seen the Kodak shop of M. Caron, apparently undisturbed, with the familiar Kodak sign—still on the main street!

It is to be hoped that the restoration of beautiful Amiens may proceed as quickly as possible, and that M. Caron and his Kodak shop

may once more be able to enjoy their old prosperity. Every well-wisher of France will hope that the era now opening will hold for Amiens and all other stricken cities a new and long tranquility and honor.

The photograph is itself a prophecy of better days.



HOW DISTANCE AFFECTS THE STRENGTH OF LIGHT

WHEN light emanates from a single point its strength, or brilliancy, at any distance from its source varies as the square of the distance.

For practical purposes we may consider a single light source, whether it be an oil, a gas or an electric lamp, as a point source of light, and when we use a single lamp for making prints from a negative we will find that, should the exposure needed for obtaining a correctly printed print be 10 seconds, when the printing frame is placed 10 inches from the light, at 30 inches, which is 3 times as far as 10 inches, the exposure required will be 3×3 or 9 times as far as at 10 inches. This will be 90 seconds.

If placed at 15 inches, which is $1\frac{1}{2}$ times 10 inches, the exposure will be $1\frac{1}{2} \times 1\frac{1}{2}$ or $2\frac{1}{4}$ times what was needed at 10 inches, or $2\frac{1}{4}$ times 10 seconds, which is $22\frac{1}{2}$ seconds.

If placed at 5 inches from the light—this being $\frac{1}{2}$ of 10 inches—the exposure required will be $\frac{1}{2} \times \frac{1}{2}$ or $\frac{1}{4}$ the exposure needed

at 10 inches. This will be $\frac{1}{4}$ of 10 seconds, or $2\frac{1}{2}$ seconds.

Experience has proven that a sufficiently uniform illumination of the negative, which will avoid overprinting the center before the edges of the negative are correctly printed, can be obtained by placing the negative not closer than the length of its diagonal from the printing light. If the length of time it takes to print at this distance has been determined, and if at this distance the printing proceeds too rapidly or too slowly, the length of time to print at any other distance from the light can be quickly calculated by the rule we have stated.



Adrian Duff, a news photographer assigned to a sector on the West front, was recently credited with the capture of five Germans. The despatch says: "Duff was armed with nothing more than a Kodak."

Kamerad!



STATELY SILENCE
Made with a Folding Kodak

WHAT IS BEHIND YOUR SUBJECT?

BEFORE making a portrait always note what can be seen behind your subject, from the viewpoint of the camera.

Many pictures have been made which suggest that trees sometimes grow on the heads of pretty girls.

Undesirable background effects

can always be avoided by selecting a suitable viewpoint from which to make the picture.

A distant landscape, distant shrubbery or anything else that shows no prominent lines will usually make satisfactory backgrounds for portraits.



WOMAN'S WORK IS NEVER DONE!"

WAR TIME REFLECTIONS
OF FEMININE
ENERGY

FROM BRITISH OFFICIAL
PHOTOGRAPHS





AN ALGERIAN MARKET PLACE
Made with a 3A Folding Kodak

THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES

CHAPTER XII—PRINTING METHODS

A GREAT number of different processes have been used at one time or another for printing negatives. The earliest printing processes depended upon the fact that silver compounds darken in light, and the first printing paper to be used generally was made by soaking a sheet of paper in a solution of table salt and washing this over with a solution of silver nitrate so as to convert the salt into silver chloride. Paper so prepared was known as "salted" paper on which, after exposure to light behind a negative, a print was obtained which could be toned by the deposition of gold from a solution and then fixed with hypo. A better paper was made by using

albumen obtained from the white of eggs. After adding salt to it the albumen was spread over the surface of the paper and then sensitized by treatment with a solution of silver nitrate.

After the gelatine process for negatives was discovered gelatine emulsions were applied to printing papers. Gelatine paper was made by emulsifying silver chloride in gelatine with an excess of silver nitrate and then coating it on paper just as films are coated with the sensitive negative emulsion. The typical gelatino-chloride paper of this type is Solio.

To use Solio, the negative is put in a printing frame, and the paper is put with its coated side in contact

with the emulsion side of the negative and pressed into contact by closing the back of the printing frame. The frame is then exposed to daylight and the image printed on the paper, which darkens to a brownish-red color. From time to time the depth of the printing is observed by opening the back of the frame. The image must be printed to a somewhat darker color than will be required in the finished picture. When printed the paper is removed in subdued light and the print is toned by immersing in a solution containing gold so that the metallic gold is deposited on the print, giving it a purple color. After toning, the print is fixed in a

hypo solution and washed. A toning process is necessary with all printing-out silver papers, such as Solio, albumenized paper, or salted paper, because if the printed-out silver image is fixed without toning, the fixing bath changes it to an ugly yellow color and a very poor-looking print results. The gold toning produces a rich-looking, permanent image which varies in color from brown to purple; these colors, indeed, used to be regarded as the only satisfactory colors for photographs.

The chief use for printing-out papers at the present time is for the making of photographers' proofs. For this purpose the negatives



AN ITALIAN GARDEN
Made with a Folding Kodak



NATIVE DIVERS, CEYLON
Made with a Vest Pocket Kodak

are printed but the prints are not toned or fixed, and, while they are satisfactory for examination, they cannot be kept because they darken in the light, the photographer supplying them only as samples to show the pose and expression, and making permanent prints to order later.

Quite early in the history of photography it was discovered that many substances besides the salts of silver are sensitive to light. One process of printing, the platinum process, is founded upon the sensitiveness to light of iron salts. If paper is coated with ferric oxalate, which is a green soluble salt of iron, and this is exposed to light, the ferric oxalate is changed into another oxalate of iron, ferrous oxalate, which is insoluble, so that a sheet of paper thus prepared and printed will, after washing, give a faint image consisting of ferrous oxalate. If, to the ferric oxalate with which the paper is prepared, a solution of a platinum compound is added and then, after printing, the faintly visible image is put

into a solution of a soluble oxalate, the ferrous oxalate is dissolved and attacks the platinum salt, which is not affected by the ferric oxalate, precipitating metallic platinum on the paper so that an image is obtained consisting of black metallic platinum. Prints made in this way are called "platinum prints" and since metallic platinum is one of the most resistant of all known materials the process may

be considered to give prints of the very greatest permanency.

Another process depends upon the fact that gelatine containing bichromate becomes insoluble in water on exposure to light, and this process is known as the "pigment" process or more commonly as the "carbon" process, the name being derived from the fact that the gelatine used in the early days of the process contained finely divided carbon or lamp black to act as a pigment. The paper is made by coating the paper stock with a thick gelatine solution containing finely divided pigment suspended in it. The pigment is chosen according to the color of the print required. For a black image it may be lamp black, for a red image red ochre or burnt sienna, and for images of other colors any permanent and stable pigment of the color desired which can be finely powdered. After the coated gelatine has been dried the paper is immersed in a solution of bichromate of potash or ammonia and again dried. This bichromated

gelatine is quite soluble in hot water, but if it is exposed to light it becomes insoluble where the light has acted upon it. The bichromated gelatine is, therefore, printed under the negative in the same way as a Solio print. No visible image is produced, and to get the visible print it is necessary to wash away the soft gelatine. The gelatine, which has been hardened by the action of light, is on the surface of the print and the soft gelatine is at the back, so in order to develop the print it is put face down onto another sheet of paper and placed in hot water. After a short time the soluble gelatine begins to ooze out at the edges of the print and the whole of the original paper can be pulled off, leaving the image covered with a sticky mass of partly dissolved gelatine on the paper to which it has been transferred. This image is then washed in hot water until all the soluble gelatine has been washed away, leaving a clear image of the pigmented gelatine on the paper.

All these printing-out processes which require a long exposure to strong daylight have, however, become obsolete owing to the trouble of working them and especially the difficulty of judging the correct exposure with such a variable illuminant as daylight, and they have been displaced by printing processes in which the paper used is coated with an emulsion very similar to that used for making the negative, but of considerably less sensitiveness. This paper, known as development paper, is exposed behind the negative to a lamp, and is then developed, in the same way as a negative, to give a visible image,



BEGGING

Made with a No. 0 Brownie

The oldest of these development papers is bromide paper. This paper is coated with an emulsion very similar to the ordinary negative emulsions but of somewhat less sensitiveness. The paper is very sensitive to light and must be worked by red or orange light only. The exposure for printing is, of course, very short and the paper is, in fact, mostly used for enlarging, the image of the negative being thrown upon the sensitive bromide paper by a projection lantern so as to obtain an enlarged picture from the negative.

About 1894 Velox paper was introduced and was an entire novelty, since while it is similar to bromide paper in that it is exposed to an artificial light and then developed and fixed, it is so much less sensitive

than bromide paper that it can be worked in a room lighted by a weak artificial light and does not require a special darkroom, from which fact it is known as "gas-light" paper. Since the introduction of Velox other gaslight papers have been made and at present almost all prints made by contact from negatives are made on gas-light papers, though Velox is still the best known of all. Velox is very considerably slower than bromide paper so that it can be handled safely in any subdued light. It requires an exposure that ranges from about 5 seconds to about a minute, depending on the density of the negative and the grade of Velox used, at one foot from a 40-watt mazda lamp, and it is characterized especially by the extreme rapidity and ease of its development, from which its name is derived, Contrast and Regular

developing fully in 15 to 20 seconds and Special Velox in about 30 seconds. It is consequently possible by using Velox to make prints in comfort and with great rapidity, the old troubles of judging the extent of the printing, and the difficulties with toning baths being entirely absent with this simple and convenient printing medium.



With Kodak Dry Mounting Tissue photographs can be securely attached to the leaves of an album, and to paper and cards of any thickness, so they will always remain flat.

The tissue is furnished in cut sheets for all standard sizes of pictures. Full instructions for use accompany every package.



ON THE SURREY DOWNS
Made with a 3.4 Folding Kodak



TWO GLIMPSES OF THE ALPS
Made with a Folding Kodak



THE FARM CART
Made with a Folding Kodak

THE RETURN ENGAGEMENT

BY JAMES B. ALLEN

IF I were asked to state the requisites for successful Kodaking, I should put it something like this: Read the manual that came with your Kodak so as to thoroughly familiarize yourself with the mechanical operation of the Kodak you have selected; then, in absolute confidence that it will take uniformly good pictures, turn your attention to the great outdoors.

You can take good pictures for the next forty years, without going outside the rules and instructions that are in the manual furnished by the manufacturers of your Kodak.

Incidentally these same manufacturers are in a better position than anyone else to render practical assistance when you actually need it. If you fail to solve any picture problem submit it to the Editors of KODAKERY. They will help you out. But even so, you will derive more genuine pleasure and acquire a higher degree of skill from a consistent study of your own picture problems, than by having someone else do your thinking for you. The joy of a good picture consists very largely in the thought that it is your own handiwork, conceived in your own sense of the beautiful,

brought to fulfillment by your own ingenuity and perseverance.

In studying the photographic qualities of scenes and objects, it is well to remember that you are learning to take pictures, not to make them. They were made by the Creator of all things great and small; and many of the most delightful ones have been waiting for us a long, long time.

And if we do not—in the Kodak sense—make pictures, neither do we destroy or alter them by the act of pressing the release lever. That bit of winding roadway which you contemplated with such keen pleasure; that old elm stooping to peer into the mystic depths of a quiet pool; that ivy-covered wall silhouetted against the sky—these pictures are still posing. If the finished prints of any subject fail to meet your fondest hopes, remember that the Kodak was not to blame, the real pictures that you saw in nature were not to blame. It was merely that you did not analyze them aright. Perhaps you did not take the picture from the viewpoint that made it look most pleasing, or gave too short an exposure for a subject that was wholly in shadow. Long shadows are usually most desirable.

Whatever may have caused the failure, why not insist upon final success in every case where it is convenient for you to return to the scene a second time? Isn't it a serious and disheartening mistake to turn your back upon a desirable picture and go rambling off on new ventures, new experiments, without first mastering the original one? Your chances with the same picture over again are better than

with a strange one, particularly if you have preserved a record of the first exposure. Such a record is provided for in the autographic feature of every modern Kodak. This recording space on each film may be likened to the space around the bull's-eye of a target. It tells you what corrections to make.

A return engagement with that bit of roadway, or that sombre elm, or that ivy-covered wall, is sure to disclose artistic possibilities in the picture which escaped you before. It will enhance your Kodaking pleasures, for with a very few such victories you will have reached a point where you can be absolutely sure of a picture the first time out.



IN SOUTHERN WATER
Made with a No. 6 Brownie

WHEN YOU BUY TWO CAMERAS

THE subscription blank that is bound in the manual furnished with every Eastman hand camera entitles the purchaser of the camera to one year's free subscription to KODAKERY.

If you purchase two cameras in the course of a year and send us, properly filled out, the subscription blanks from both the manuals, each blank will bring you KODAKERY for one year from the date it is received by us, but, unless you notify us that you have purchased two cameras within the year we cannot know this fact and your two subscriptions will overlap, so you will receive two copies of some issues but will not receive the magazine for the full two years period. For instance, if you purchased a camera in May, 1918, and promptly sent us the subscription

blank you would receive KODAKERY for one year—until May, 1919, and then, if in December of 1918 you purchased another camera and promptly sent us the subscription blank, this would bring you KODAKERY until December, 1919, consequently you would receive duplicate copies of the numbers published between December, 1918, and May, 1919, while if you notified us of the two purchases at the time you sent in the second blank, and stated the date your first subscription expired, we would extend the date of your second subscription so it would continue for one year from the expiration of the first and, as a consequence, you would receive the benefit of the magazine, free of charge, for a full two year period—that is until May, 1920.



A STREET IN OLD GENOA

Made with a 3A Folding Kodak. Exposure, 1-25 sec.; stop 4; July

LET US DO FOR YOU WHAT WE HAVE DONE FOR OTHERS

THE first number of KODAKERY, published in 1913, invited its subscribers, and all other amateur photographers, to write us regarding any photographic problems that they encountered.

This invitation was instantly accepted by so many amateurs that we have made it permanent, and, as a result, we have, during the past five years, taught many thousands of photographers how to make the kind of pictures they want.

The following extracts, from two letters, are typical of the comments we are constantly receiving from those we have assisted:

"I am much impressed with your demonstrations of service. I must thank you for what might be termed the personal tone of your advice."

"I also desire to express my appreciation of your courtesy, and effective response to my plea for help."

We will take pleasure in giving you this same service. If you need assistance in picture-making write us a detailed statement of your problem. If your negatives or prints are not satisfactory, send them to us, with full information regarding exposure and development. Whatever your photographic problem may be we will help you solve it. There is no charge for this service.

Address all Communications,
"KODAKERY," CANADIAN KODAK CO., LIMITED,
TORONTO, CANADA

For your
VEST POCKET KODAK



**Kodak Serial
Printing
Frame No. 2**

Instead of detaching the V. P. K. negatives they are left in the continuous strip which slips easily through the Serial Frame from exposure to exposure, and greatly facilitates the printing process.

Price, 65c.



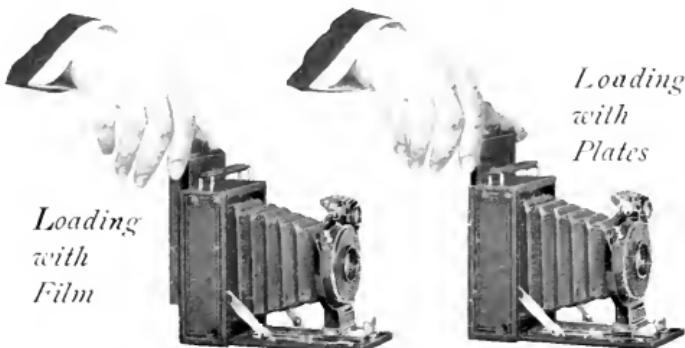
**Vest Pocket
Kodak Tripod
Adapter**

Slips over the front standard of the Kodak and adapts it for tripod use either in a vertical or horizontal position. Instantly attached or detached.

Price, 50c.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

All good dealer's



THE PREMO No. 12

Small—but quality all the way through

THIS Premo twelve gives pocket convenience plus adaptability to all-around serious work. It may be used with Cartridge Film or Film Packs, and it ordinarily will be. But when there is a call for use with an Orthochromatic or Process plate, or any kind of a plate for that matter, it is equally ready.

Focus as you please, with scale and finder or on the ground glass. Use as you please, in the hand or on a tripod.

The pictures are $2\frac{1}{4} \times 3\frac{1}{4}$ inches. The shutter speed is 1/300 of a second, with slower speeds, of course. The camera is unusually small, but we have not made the mistake of using a too short bellows draw (requiring excessively wide angle lenses) nor too small a shutter, meaning the loss of the use of the full opening of the fast Anastigmat lenses. It is compact—but not to the point of a loss in efficiency.

The workmanship and finish are the best. Price \$19.75 to \$74.00, according to lens equipment.

Premo catalogue at your dealer's or by mail

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA



*Kodak Flash
Sheet Holder*

Flashlights

WITH the possession of a Kodak, Eastman Flash Sheets and the Kodak Flash Sheet Holder, any amateur has at his disposal all the requirements for good flashlight work.

Send for the booklet "By Flashlight"

THE PRICE

No. 1 Flash Sheets, per package of $\frac{1}{2}$ dozen sheets -	- \$0.35
No. 2 Flash Sheets, per package of $\frac{1}{2}$ dozen sheets -	- .56
No. 3 Flash Sheets, per package of $\frac{1}{2}$ dozen sheets -	- .84
Kodak Flash Sheet Holder -	- 1.25

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's



THE GRAFLEX

THE practical simplicity of Graflex operation assures increased pleasure and certainty in picture making.

You see the subject full picture size, right side up, *before* you take it.

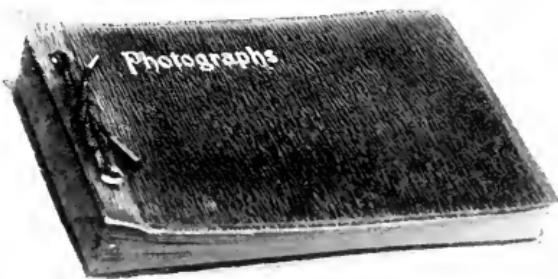
You arrange the focus and composition of the picture—*just as you want it*—then instantly make the exposure upon Graflex Roll Film, Premo Film Packs, or your favorite plate—whichever is the most suitable or convenient.

*Ask your dealer or write
us for Graflex Catalogue.*

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

THE only way to keep prints properly—safe against loss or injury—is between the pages of an album.

The Balmoral Album



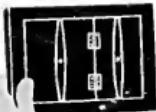
with black leather covers and made in the loose leaf style is as practical in use as it is handsome in appearance.

THE PRICE

A, 5 $\frac{1}{2}$ x 7, 50 black leaves	-	-	-	-	-	\$2.50
B, 7 x 10, 50 black leaves	-	-	-	-	-	3.50
Package 12 extra leaves, A	\$0.18;	B,	\$0.25			

CANADIAN KODAK CO., LIMITED
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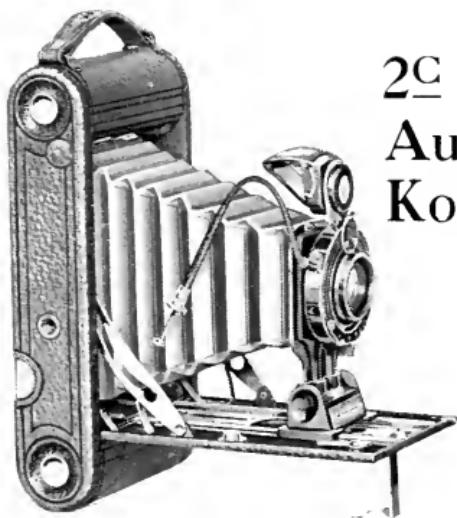
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2C

Autographic Kodak, Jr.

Pictures
 $2\frac{1}{4} \times 4\frac{1}{8}$
inches

THE picture size recommends it as does the fact that the ability to make generous-sized pictures that fit the view has been secured not through bulk but through clever workmanship. The 2C Junior is compact to the point of thinness.

It is autographic, the shutter is Kodak Ball Bearing with speeds of 1 25, 1 50 and 1 100 of a second, besides, of course, the regular bulb and time actions, the finder is the collapsible reversible type and the camera is fitted with automatic focusing lock and tripod sockets for either vertical or horizontal pictures.

THE PRICE

2C Autographic Kodak Jr. with single lens - - - - - \$16.75

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A
MAGAZINE *for* AMATEUR
PHOTOGRAPHERS



JUNE 1919

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TORONTO, CANADA.

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If it isn't an Eastman
It isn't a Kodak



A PLEASANT INTERLUDE AT RHEIMS
Made with a Graflex by Donald C. Thompson



PUBLISHED MONTHLY—YEARLY SUBSCRIPTION, 50 CENTS; SINGLE COPIES, 5 CENTS.

VOL. VI

JUNE, 1919

No. 8



ON LAKE GENEVA, SWITZERLAND

Made with a Folding Kodak

THE WAYS OF PEACE

BY ALBERT CRANE WALLACE

THE Great War so long held the hearts and minds of the world that days not filled with war and the echoes of war have found us with new lessons to learn, and an odd feeling of having to readjust ourselves to the simplest things in life. After a while everything became colored by war. And now the

colors of peace must take their time in coming back.

For example, nothing could seem, in itself, more peaceful than a camera. Surely it contains no suggestion of conflict. The peaceful, kindest person you know could not suggest a less turbulent companion than a Kodak. Yet, of



THE PAINTER
Made with No. 1 Kodak Junior

a sudden, by the accident of war, the camera came under pressure. Like the kindest person it had to be shut out here and there. Its very truthfulness became a hazard, for war must have its secrets, and its secrets must be kept.

So for long years the camera has had to live behind certain barriers just as ordinary citizens have had to live behind certain barriers—unless it was an official camera. When it was an official camera it went everywhere—under the sea in the cabins of the submarines, and into the sky with the fliers. In fact it went so far, saw so much, became so valuable a witness, contrived to be of such immense service to war that we shall never again be likely to think of it as an inevitably harmless observer.

In fact it went into service like a soldier.

But like a soldier it is coming back to its own. It is returning to the ways of peace. Like the soldier it is turning its face away from scenes of excitement and devastation to scenes of beauty and tranquility. And where it has lived at home—the picture-hungry soldier was glad of its work at home—it is better able than it has been for a long time to express simple and comfortable things that help the world to forget its troubles.

I hope you won't think me too fanciful in thus comparing a camera to a person. My cameras have always had a personality for me. Each has its own. One old friend in particular is especially dear for having traveled with me patiently and faithfully for scores of thousands of miles. As two old cronies will get together and recount adventures passed in each other's

company, so I pat the old camera as a choice companion to whom I address unspoken reminiscences.

I can imagine the sentiments of a man who has worked a camera under fire, as so many of them did. And I can imagine how he will like to give the same camera a less perilous time in scenes of another kind.

If we are to get acquainted again with the beauty of life the camera will be one of our best side-partners. The Kodak has been game. It has asked no odds. It has been scout, observer, historian in times of

supreme stress. It has made good.

Now its days of happy play and normal work are coming again. Its range of usefulness and its range of pleasures widen. Its capacity, its agility, its companionability are greater than ever before, and soon a disturbed world will have thrown open once more all its ways for free and charming adventure.

The paths of peace will look good. Meanwhile I have reason to be grateful to the camera for reminding me that even a world at war never stopped having time to be interesting and to be alluring.



AN AMSTERDAM CANAL.
Made with a Kodak

DEVELOPMENT WITH PYRO

QUITE often inquiries come to us regarding the cause of the yellow color which films developed in the Kodak Film Tank usually possess. Can it be prevented, and if so, how?

Research and experience unite in establishing the fact that Pyro is the best developer for negatives. One manner in which it differs from other developers is in the production of a "stain image" in addition to the usual black image. While there is a yellow tinge over the whole negative it is this "stain image" in conjunction with the black image which constitutes

the chief advantage of Pyro, for the negative will be of a less actinic color and the print, in consequence, much brighter and with a longer scale of gradation.

This is one of the reasons why negatives developed in the Kodak Film Tank have such excellent printing quality.

If the yellow stain is unusually deep it points to the use of an old or unsuitable fixing bath. The Acid Fixing Bath recommended, when freshly made, will remove a great deal of the unnecessary stain, just leaving enough to secure the proper printing quality.



IN THE GROUNDS OF THE TEMPLE, CALCUTTA

Made with a Folding Kodak



OBEDIENT TO SIGNAL

Made with 3-A Folding Kodak, by C. R. Edwards. The pulling of a string (showing in the picture) released the shutter

INCLUDE YOURSELF IN THE PICTURE

WHEN you go for an outing with a party of friends and take your camera along to photograph the group you ought to get a picture that shows every member of the party, but how to take the picture and also be included in it may puzzle you as it has puzzled others.

Various methods of solving this problem have been tried, but the devices employed were often troublesome to use and frequently failed to accomplish the desired

results. Many workers have tied a long string to the shutter release so that some member of the group could pull the string and thus make the exposure while remaining in the picture.

That good work can be done by this method, under favorable circumstances, is attested by Mr. Edward's picture on this page, but the handicaps that the string entails have greatly limited its use. The two greatest drawbacks are the risk of blurring the picture, by



THE CATCH

*Self Portrait made with 3A Folding Kodak by the method
illustrated on opposite page*



HOW THE CATCH WAS CAUGHT BY THE CAMERA
Show us the method of making the Self Portrait shown on opposite page. A indicates the Kodak Self Timer; B the Kodak flash sync cord.

moving the camera when the string is pulled, and the difficulty of concealing the string so it will not show in the picture.

A simpler and more reliable way, which effectually solves the problem, is to place the camera on a tripod or any other firm support, or to fasten it with a Kodapod to a fence, to the branch of a tree, or to a stick driven in the ground, and then let the Kodak Self Timer automatically make the exposure after you have taken your position in the group.

The Kodak Self Timer can be carried in a vest pocket and it will operate any hand camera shutter that is fitted with a cable release. The speed at which it works can be adjusted so that it will operate the shutter in from a few seconds to a few minutes after its mechanism is started. By setting it to operate the shutter in about 30 seconds you will have ample time to walk from the camera to the position you wish to occupy in the group.

The speed at which the timer works has nothing whatever to do with the length of time the film is exposed, for the timer merely trips the shutter, while the length of ex-

posure is determined by the shutter speed that is used.

The Kodak Self Timer has opened a new field in which interesting and valuable work can be done, for it enables us to include ourselves in the pictures we make *when we are alone*.

The figure is needed in many a landscape scene for improving the composition. When we use the self timer we can introduce the figure by placing ourselves in the necessary position, and by so doing we may often transform what might otherwise prove merely the record of a scene into a pictorial composition.

But of even greater importance than pictorial considerations is the fact that pictures which show us in our favorite haunts, whether we are alone or with others, are always of interest, not only to ourselves, but to our families and friends as well.

The fisherman, for instance, shown on page 8, has enjoyed an outing which this picture will always recall. On this trip he went alone, and this picture was secured by using a Kodak Self Timer and a Kodapod, as is shown in the illustration on page 9.



NEVER OIL THE SHUTTER

ONE of the surest ways of putting a photographic shutter out of order is to oil it.

The fact that a watch needs oil is no evidence that a shutter needs oil. A watch has many bearings, which are intended for continuous

service. It is expected to run day and night, without a rest, for many months, and its bearings are specially designed for running in oil.

The construction of a photographic shutter differs greatly

from the construction of a watch. It has comparatively few bearings. These bearings operate only when the shutter is opened and closed, and they are designed to work wholly without lubrication, consequently, if oil is introduced into

the bearings of a shutter it will seriously interfere with its working.

By remembering these facts and by never oiling the shutter on your camera it will, if protected against dust, moisture and physical injury, render good service for many years.



AN AMERICAN NURSE IN SERBIA
From a Graflex Picture by Donald C. Thompson

THIS IS THE WAY SHE HAD TO BOIL HER CLOTHES



AN ALWAYS POPULAR PICTORIAL SUBJECT—NIAGARA
Made with No. 24 Brownie

A PROFITABLE HABIT

THE frequent use of any particular camera makes us so familiar with its mechanical equipment that in using the camera we do many of the things that need to be done without really thinking about them, because we have formed the habit.

Every photographer who uses an Autographic Kodak, Graflex or Brownie should acquire the autographic habit, that is, the making of an autographic record on the film immediately after it has been exposed.

One of the most important things to record is the date. By autographing this on the film any controversy that may ever arise about when the photograph was made can be quickly settled.

The answer to the question, "On what date was this picture taken?" could have determined the result of many a lawsuit.

The importance of recording dates is apparent to all of us who have been making pictures for years, for every time we look through our collection of pictures, we realize how hopeless it is to determine even the year, to say nothing of the month, day and hour, when some of them were made.

The autographic habit renders us a double service; it gives us the valuable record, which appears on the end of the film after it has been removed from the camera and developed, and, while the film is still in the camera, it protects us from the danger of making two exposures on one film.

Before Kodaks were made autographic the camera could not tell us whether the film had been reeled to the next number after it was exposed, and when we were in doubt about it, and took a

chance on the film not being exposed, we sometimes made two exposures on one film, while if we reeled the film to the next number, to avoid the chance of making a double exposure, we sometimes found an unexposed film in the roll after it was developed.

Now, however, by autographing the film immediately after it is exposed, we need take no chances on either double exposures or blanks. When we wish to know whether the film was reeled to the next number after it was exposed, we can quickly find out by looking in the autographic slot. If we find an autographic record there we will

know the film was exposed, and if we find no record we will know the film was not exposed.

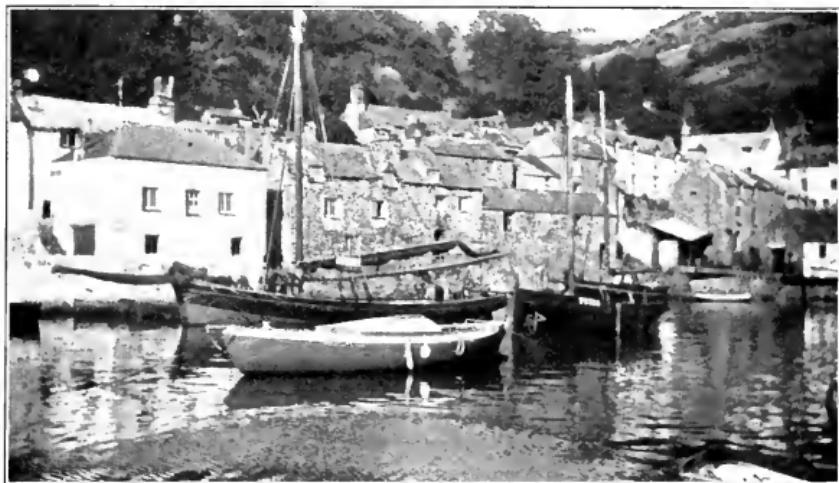
In either case we will know exactly what to do so as to avoid the risk of losing two pictures and one film through a double exposure, or losing a film that remained blank because it was reeled past its number without being exposed.

A permanent record on the film of the date and the hour the exposure was made, followed by such other information as you may wish the film to bear, and the safeguard against double exposures and blanks, are what you will gain by forming the autographic habit.



STREET SCENE IN BUCHAREST, ROUMANIA, "THE PARIS OF THE BALKANS"

Graflex Photograph by Donald C. Thompson



A CORNWALL HARBOR
Made with No. 1A Special Kodak

SIMPLE INTENSIFICATION

THE keynote of Kodakery is simplicity and if one article can be made to serve two purposes, a step forward has been made. The simplified process of Sepia toning by means of the Velox Re-developer has been constantly growing in popularity since its first introduction, but it is not generally known that the process, when applied to a negative instead of to a Velox print, will give it a very considerable degree of intensification.

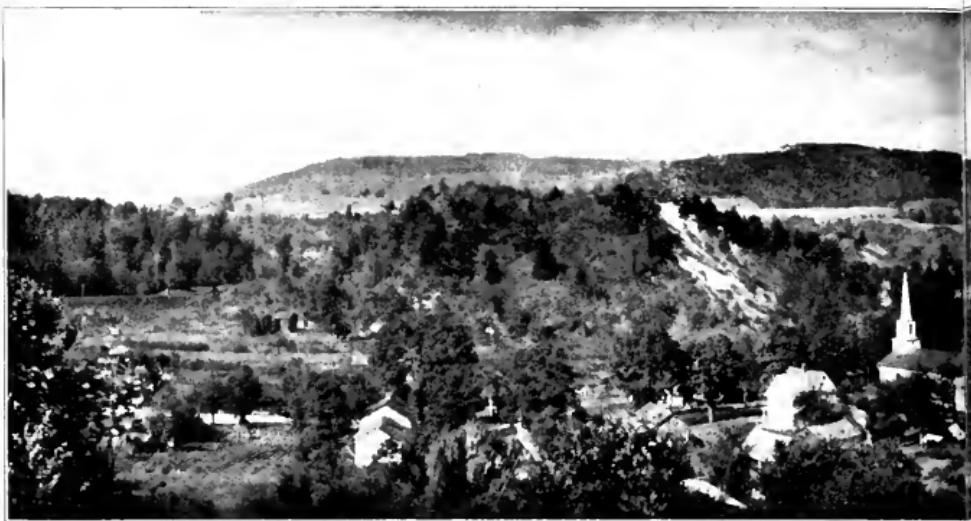
Most intensifiers attain this end by depositing something on the silver which forms the negative image, this substance being usually mercury, giving the negative a greater opacity, so that it will yield a brighter and more contrasty print. The Velox Re-developer works in a different manner but achieves the same result. Exactly as in the case of sepia toning a Velox print, the image is converted into sulphide of silver but the sepia colored negative image will

not transmit as much actinic light as it did before being toned and the prints will show a marked improvement in brilliance.

With tray-developed negatives there is a tendency to continue the development of underexposed negatives beyond the proper time in the hope of obtaining more detail in the shadows. This makes the scale of gradation very steep and when the half-tones have correctly printed the high-lights will be "chalky" and lacking in detail. Negatives of this type are quite unsuitable for intensification. If, however, the negative has been developed for the proper length of time for the strength and temperature of the developer used, intensification will improve it, if it is not strong enough to yield a good print. Negatives developed in the Kodak Film Tank will be correctly developed and if underexposed can often be intensified with advantage.



IN OLD VENICE
Made with a Folding Kodak



MILLPORT, NEW YORK.

To travel without a camera means that sooner or later our memory of the places visited will become hazy. We will wholly forget much that we wish to remember, and in trying to recall the appearance of any particular scene we may construct a mental

THE MAKING

picture of it which is woefully inaccurate.

Nothing can so vividly or so accurately recall a scene as a picture, and no other style of picture can so adequately portray a broad expanse of landscape as a panorama.

Making panoramas is as easy as making ordinary pictures, but it is a different kind of work, and it is the kind of work that the Panoram Kodak can do better than any camera that is intended for regular photographic work.

The Panoram Kodak makes long, narrow pictures in which there is no



MILLPORT, NEW YORK. *Made with a Folding Kodak*



de with No. 4 Panoram Kodak

F PANORAMAS

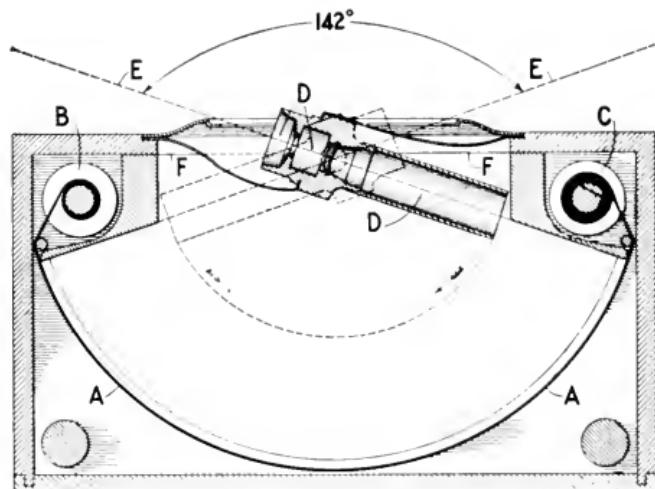
excess of sky or foreground, and it includes an unusually wide angle within its field of view without using a wide angle lens.

To make clear how these things can be done with a light-weight hand camera we will refer to the diagram in describing the special features of Panoram Kodak construction.

The curved line A represents the film, of which a section is reeled from the film spool B to the spool C after each exposure. The exposure is made by pressing a button, which causes the tube D, in which the lens is mounted, to describe a half circle as it swings on its axis while the film is being exposed.

The diagram shows

the positions the lens tube occupies near the beginning and near the end of the exposure period, and the dotted lines E show that by this method of construction a narrow angle lens, which makes larger images of objects than a wide angle lens can make from the same point of view, is enabled to make



NO. 4 PANORAM KODAK

pictures that embrace an enormous angle within the field of view, the No. 1 Panoram embracing a field of 112 degrees and the No. 4 a field of 142 degrees.

When the lens tube has swung to its limit of movement, from right to left or from left to right, it lies parallel with the lines F, at which position it is impossible for any light to pass through the lens and reach the film.

It will be noticed that the focal plane, where the film lies (A in diagram), has a curved instead of a flat field. This is one of the features that enables the Panoram Kodak to do what ordinary cameras cannot do. But this feature renders the camera unsuitable for making pictures, *at short range*, of subjects in which there are long, straight lines running lengthwise of the film. If this is attempted all the long straight lines that run the long way of the film, excepting the one that passes through the center of the picture, will be rendered as curves.

This difficulty in short range work has, however, often been wholly overcome by making the picture from a point of view that will make such lines extend across the field at an angle of 45 degrees.

Panoramic cameras are splendidly adapted for making short range pictures of groups. The way to arrange a group of people for a panorama is to place them along a line that forms the segment of a circle, with every member of the group at the same distance from the lens. Such a grouping can easily be arranged by fastening one end of a long cord to a stick that is driven in the ground at the posi-

tion from which the picture is to be made. With this cord the curve along which the group is to be arranged can quickly be drawn. If the group is so large that all the members cannot be included in a single line two or more lines may be formed along the curve.

When all parts of such a curve are the same distance from the lens the curve will be rendered as a straight line in the picture, and the relative size of all the individuals in any one line will be correctly shown.

The structural features that impose the limitations we have mentioned on the Panoram Kodak for short range work are the very features that make it superior to the ordinary camera for long range landscape work—the special work for which it was primarily designed.

A picture of a distant landscape made with a hand camera of the usual type will include but a small part, while a panorama of a distant landscape will include the greater part of the view we can see spread out before us.

In distant landscape work it rarely happens that long, straight lines extend lengthwise of the picture, and if any such lines do exist they will, owing to their distance from the camera, usually be rendered so nearly straight that the eye cannot detect any curvature.

The only way to fully appreciate what a Panoram Kodak can do is to use one, but an idea of its work can be obtained by comparing the panorama on the preceding page with the picture that was made with a camera of the regular type, shown on page 16.

Both these pictures were made

from exactly the same point of view, and the images in both pictures are of practically the same size.

If these happened to be pictures of a section of country in which you were interested, which would you prefer?

The weekly automobile trips, the summer vacations, the other journeys that take you among

new scenes, and the vast field of scenic beauties near your own home, which man is forever changing for better or for worse, all afford opportunities for making panoramas—the only kind of pictures that can include enough of the subject to show the relative positions of widely separated objects on the landscape.



A TIBETAN "PRAYER-MILL" RUN BY
WATER POWER

*Made with 3-A Kodak, by V. C. Plymire
Stop, f.11; exposure, 1-10 sec.*



FIG. 2

THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES

CHAPTER XIII—THE CHOICE OF THE PRINTING PAPER

VELOX paper is made in three grades of contrast to fit different types of negatives. The paper was originally made in the Regular grade only, but it was found that many negatives were too contrasty to print well on this paper and Special Velox was manufactured for use with such negatives, while recently Contrast Velox has been put on the market for use with negatives so lacking in contrast that they will not give good prints even on the Regular grade.

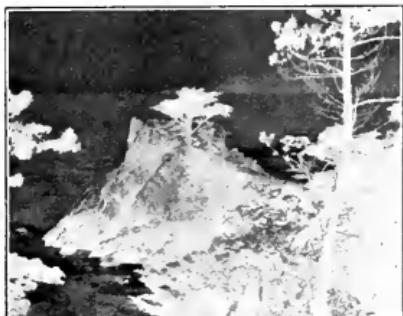
If we make three negatives of the same subject in succession, giving each exactly the same exposure, and then develop these for different lengths of time so that the first will be underdeveloped, the second correctly developed and the third overdeveloped, the first negative will have a short range of contrast, the second a medium range, and the third a long range. If we then print the first negative on Contrast Velox, the second on Regular Velox, and the third on Special Velox, we shall get almost identical prints on all three papers provided that the contrasts of the negatives just fit the various grades of the paper. This is shown in Fig. 1.

We might think that Contrast

Velox would always give more contrasty prints than Regular Velox; it will if both papers are printed on the *same* negative, but if the Contrast Velox is printed on a flat negative and the Regular Velox on a normal negative, then the Contrast Velox will compensate for the flat negative and give a *normal* print, just as the Regular Velox gives a *normal* print from a normal negative, and the Special Velox a *normal* print from a contrasty negative.

All the grades of Velox give the same range of reflecting powers in the print provided that they are used with negatives which will enable this range to develop. Suppose we take a black wedge which contains all the degrees of light intensities, from absolute opacity at one end to absolute transparency at the other end and make a print of it. We should get the result shown in Fig. 2. This shows the entire range of reflecting power of which the paper is capable, the range varying from white paper at one end to the blackest silver deposit which the paper can give, at the other.

With any "velvet" surface paper, such as Velvet Velox, we shall find that the white paper will



Soft Negative of Little Contrast



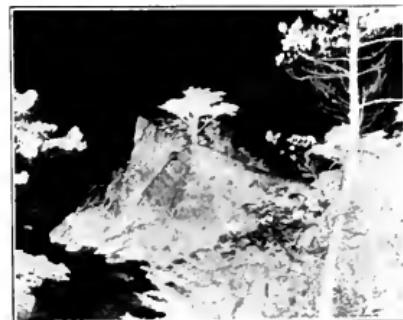
Print from Opposite Negative



Average Negative of Medium Contrast



Print from Opposite Negative



Hard Negative of Strong Contrast



Print from Opposite Negative

FIG. 1

reflect about twenty-five times as much light as the deepest silver deposit. The number of distinct tones which are included in this range from white to black depends,

of course, on the ability of the eye to distinguish them. The eye can actually see about one hundred distinct tones in such a range.

In Fig. 3 is shown a range of



FIG. 3

tones made up, not as a continuous wedge, but of forty-four distinct tones. The number which can be seen in the illustration is less than the number which the eye can distinguish in a print because of the limitations imposed by the process of half-tone reproduction. If the full one hundred tones which the eye can distinguish in a print were reproduced by the half-tone process the half-tone illustration would look like a continuous wedge.

In Fig. 4 the same wedge has been printed on all three papers, and it will be seen that Contrast Velox has reached its full blackness only a short distance up the wedge, Regular Velox has gone farther, and Special Velox has gone the farthest of all, so that while all three papers will give the same range of tones, this range is impressed on Contrast Velox with only a short range of densities in the negative; for Regular Velox a longer range is needed, and for Special Velox a still longer range.

The range of densities required in a negative to just print out the full range of tones on a paper is called the "scale" of the paper and this is measured by trying an increasing series of exposures until the range of exposures which will just give the whole range of tones on the paper is found; that is, if an exposure of one second to the bare paper with no negative will just

give the first perceptible difference from white paper, so as to show the first trace of tint on the paper, and an exposure of twenty seconds will give the deepest black the paper is capable of rendering, so that no increase of exposure will produce any denser black, then we should call the scale of the printing paper 1 to 20.

Thus the word "scale" applied to a printing paper does not refer at all to the range of tones in the print. It indicates the range of contrast in the negative which should be printed on that paper. A paper with a scale of 1 to 20 will require a negative in which the densest part



FIG. 4



FIG. 5



FIG. 6

lets through $\frac{1}{20}$ of the light transmitted by the clearest part, because if this negative is printed on that paper the print will just have the whole range of tones from white to black completely printed out, each tone in the print corresponding to a density in the negative, and there will be no differences of density in the negative unrepresented by differences of tone in the print.

Special Velox has a scale of about 1 to 20 and is suitable for printing from contrasty negatives. Regular Velox has a scale of about 1 to 10 and is suitable for printing from negatives of moderate contrast, while the very flattest and least contrasty negatives, which are the result either of excessive over-exposure or underdevelopment should be printed on Contrast Velox, which has a scale of about 1 to 5.

It is important to choose the grade of paper correctly for the negative. If the paper is too contrasty for the negative; if, for instance, we print a hard negative



FIG. 7

(one that has strong contrast) on Contrast Velox, then we shall have to sacrifice a part of the scale of the negative; either we shall get the highlights empty and white, as shown in Fig. 5, or we shall get the shadows blocked up, as shown in Fig. 6. On the other hand, if the scale of the paper is too long for the negative and we print a soft negative (one that has little contrast) on Special Velox, for instance, when we should have used Regular Velox, then we shall get a gray, flat print, as is shown in Fig. 7.



SAFETY FIRST

PREMO DEVELOPER FOR PREMO FILM

USE the developer powders that are put up for the particular tank you are using. Use Premo Tank powders for

Premo Film Packs—Kodak Tank powders for Kodak Films. Premo Film Packs are made from Kodak film but are given a special after-

treatment to prevent abrasion. This does not affect the speed or photographic quality but *does affect* the development. The Premo developer powders are, therefore, necessary to the obtaining of satisfactory results. Premo Film Packs, when developed with Kodak powders, will be underdeveloped.

In an emergency the Kodak powders may be used with Premo films by an increase of 50% in the length of development (30 minutes instead of 20 minutes at 65° Fahr.), but the safe and sure way is to use the developer that is made to fit the product. Premo powders for Premo films.



PHOTOGRAPHING SUBJECTS THAT FACE NORTH

We need not go south of the equator to see the sun shining on the north side of a building, for in the northern hemisphere the sun rises north of east and sets north of west, from the vernal equinox in March until the autumnal equinox in September, so that near the sunrise and the sunset hours, all through the summer months, direct sunshine reaches the north side of objects on the landscape.

The most attractive side of many a building and the most picturesque side of many a landscape is the side that faces north, and if we photograph this north side while the sunlight is shining directly on it we will secure a picture that shows more tones of light and shade than could be recorded in any picture that was made when the subject was wholly in shadow.

But it sometimes happens that the most interesting part of a subject we wish to picture with sunshine on its north side will be hidden by foliage after the trees put out their leaves. In this case the picture must be made shortly after the sunrise or shortly before the sunset

hour in spring, before the leaves come.

The best time to photograph a waterfall that faces north is in the early morning and late afternoon hours in spring or summer when the sun is shining on the falling water. It is impossible to picture such a subject at other times without working against the light, and if this is done the falls will be in shadow and the picture will lack the snap and brilliancy that sunlight combined with shadow always gives.

In making pictures during the hours when the sun is near the horizon we should be careful not to under-expose, for the light at these hours is not as strong as at other times of day.

Light-colored subjects that show few dark tones can usually be successfully photographed, with cameras that have double lenses, by giving an exposure of $\frac{1}{25}$ second with stop 8 (*f*.11 on anastigmats), not earlier than half an hour after sunrise or later than half an hour before sunset, while dark-colored subjects, or subjects that have plenty of dark shadows,

should receive an exposure not shorter than $\frac{1}{25}$ second with stop 4 on rectilinear, or stop f. 8 on anastigmat lenses.

With single lens, fixed focus box cameras that have no stops marked 4, 8 or 11, and with single lens, folding cameras that have stops marked 1, 2 and 3, it is best to

make the pictures not earlier than one hour after sunrise or later than one hour before sunset, giving light-colored subjects a snapshot exposure through the largest stop and dark-colored subjects and all subjects that have plenty of deep shadows, a time exposure of one second, with the camera on a tripod.



THE CASTELLO, MILAN

Made with 1.A Kodak

LET US DO FOR YOU WHAT WE
HAVE DONE FOR OTHERS

THE first number of KODAKERY, published in 1913, invited its subscribers, and all other amateur photographers, to write us regarding any photographic problems that they encountered.

This invitation was instantly accepted by so many amateurs that we have made it permanent, and, as a result, we have, during the past five years, taught many thousands of photographers how to make the kind of pictures they want.

The following extracts, from two letters, are typical of the comments we are constantly receiving from those we have assisted:

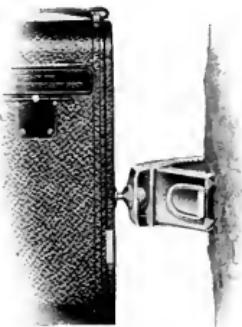
"I am much impressed with your demonstrations of service. I must thank you for what might be termed the personal tone of your advice."

"I also desire to express my appreciation of your courtesy, and effective response to my plea for help."

We will take pleasure in giving you this same service. If you need assistance in picture-making write us a detailed statement of your problem. If your negatives or prints are not satisfactory, send them to us, with full information regarding exposure and development. Whatever your photographic problem may be we will help you solve it. There is no charge for this service.

Address all Communications,
"KODAKERY," CANADIAN KODAK CO., LIMITED,
TORONTO, CANADA.

KODAK HELPS



Kodapod

Strong jaws that grip tree or fence and hold the camera steady for a time exposure. A tripod substitute that is small enough to palm—big enough to perform.

Price, \$2.00



Kodak Self-Timer

This little device enables you to take your own picture. Attached to the cable release on your camera it "clicks" the shutter from one-half second to three minutes (as you prefer) from the instant it is set.

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The pictures are $2\frac{1}{4} \times 3\frac{1}{4}$ inches. The shutter speed is 1/300 of a second, with slower speeds, of course. The camera is unusually small, but we have not made the mistake of using a too short bellows draw (requiring excessively wide angle lenses) nor too small a shutter, meaning the loss of the use of the full opening of the fast Anastigmat lenses. It is compact—but not to the point of a loss in efficiency.

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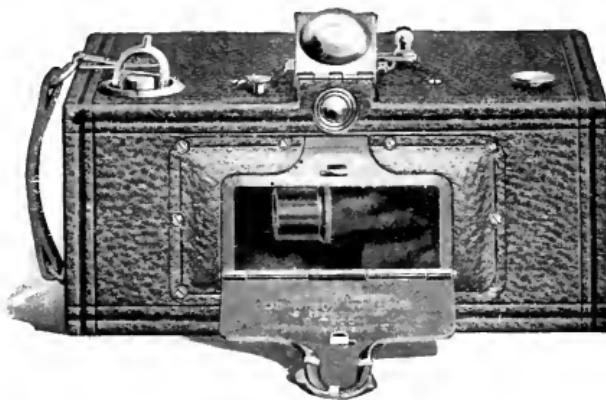
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KODAKERY

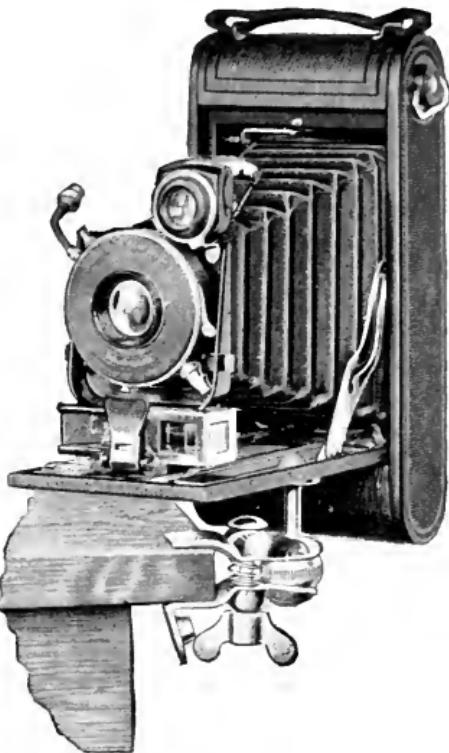
A
MAGAZINE *for* AMATEUR
PHOTOGRAPHERS



JULY 1919

CANADIAN KODAK CO., LIMITED.
TORONTO, CANADA.

FOR photographing objects at close range—wild flowers, for example—the ball and socket principle on which the



Optipod

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If it isn't an Eastman
It isn't a Kodak



DINNER TIME

See "A Bit of Robin Biography"



KODAKERY

A Journal for Amateur Photographers



PUBLISHED MONTHLY—YEARLY SUBSCRIPTION, 50 CENTS; SINGLE COPIES, 5 CENTS.

VOL. VI

JULY, 1919

No. 9



DAINTY MORSELS

A BIT OF ROBIN BIOGRAPHY

BY HOWARD TAYLOR MIDDLETON

Illustrated by the Author

IT was purely by accident that Marie and I discovered the home of the robin redbreasts. It was hidden away in the fork of a young hickory at the edge of a pond, and, at the time of our first

visit, was not yet tenanted. While the inner lining of mud and fine grasses was still damp, it appeared to be quite finished, and we felt sure that in a day or two we would find a beautiful blue egg deposited



APPRECIATIVE DINERS

there, the first step toward a family.

What appealed to us particularly about this robin's abode was the fact that it was just at the height of our tripod, which made possible the doing away with all cumbersome accessories in photographing it, a

rare piece of luck in the taking of nature pictures.

It was our desire to procure a complete set of portraits depicting the family life of the nesting birds from the laying of the first egg to the time when the young were ready to fly, and this seemed an



AS OLIVER TWIST SAID—"MORE!"

ideal opportunity. Our hopes, in this regard, however, were dashed to earth, for business cares absorbed our whole attention for a considerable time, and when we next visited the nest, three husky juveniles were very much in evidence to welcome us.

We immediately decided upon a set of pictures showing the parent birds feeding their young. We proceeded, therefore, to set up our long focus Premo on an Eastman Metal Tripod, focus carefully on the nest, and set the shutter at $\frac{1}{50}$ second, with the largest lens stop.

This accomplished, we attached a strong thread to the shutter release in order that we might make the exposure from a distance, and, moving away to a safe position, awaited developments.

We did not screen the camera with branches, making it invisible to the keen eyes of our feathered friends, as is necessary when photographing the timid forest denizens, for we were curious to know whether the old birds would come to their children with that formidable looking black object at their front door.

We had not been in hiding more than a few moments before one of the robins arrived in the vicinity of the nest with a fat angle worm in its beak, and, perching upon a limb above the camera, scolded soundly. Eventually, being satisfied that the box did not move and was, therefore, quite harmless, and urged on

by its mate which had also arrived upon the scene by now, it dropped down to a branch very near the nest.

By this time the young birds were quite wide awake and evidently exceedingly hungry, for their mouths were agape as they clamored loudly for nourishment.

Then parental love triumphed completely over timidity, and dinner was served at Robin Villa.

Perched upon the edge of the grassy bowl, the proud parent fed her young. Just as the tiny beaks rose above the nest rim, and the beak of the parent, food laden, descended to meet them, the thread was pulled, and an interesting picture was ours.

It was by the same method that the three other pictures in the series were procured, so that the above explanation applies equally to all.



AN AMSTERDAM STREET
Made with a 2A Brownie



TEACHING DOLLY TO ACT
Made with a No. 2C Kodak Junior

A
RED CROSS
DOCTOR
AND
HIS KODAK



*Copyright by
Kodak & Herbert
New York*

THE DOCTOR AND THE KODAK

BY ALBERT CRANE WALLACE

WHAT do you suppose the doctor is photographing? I know only that he was standing in front of a first aid station, and that he was photographing with a Kodak. To be sure, I knew also that he preferred a camera rest, which happened to be handy.

A comrade doctor may be standing ten feet away. Or a lucky nurse who thought that even if she couldn't send a print home she should have a record of a spot that may have had extraordinary dramatic interest for both of them. That scene beyond, whatever it was, may, indeed, have been subject enough to challenge a desire in the doctor.

How many participants in the Great War will return home with indelible impressions of places and people! How photographs that may supplement these mental images will be cherished! And then, I know one lieutenant who is bringing home a simple little Kodak picture of a companion's grave—just a little mound, a helmet and a cross—but it will be worth a lot to a certain mother.

These things have had to be held back, but they will come home at last, with sentiment, tragedy, or simply fun clinging to them. Whatever their story they will have an eloquence—particularly for those whose interests lend significance to the record.



THE AMERICAN RED CROSS AT KIEF, RUSSIA, IN 1915

Made with a Graflex, by Donald C. Thompson



INDIAN PIPE

IN THE HOMES OF THE WILDFLOWERS

THE wildflowers make their homes everywhere—in the open fields, in the forests, along the roadsides and even in the water. Some of the wildflowers, like some of the birds, seem to like the neighborhood of man and make their homes in his fields and gardens and, when he crowds them out of the cultivated ground, they take possession of the hedgerows and fence corners.

The flowers always look pleasant and are always good subjects for a picture, and photographing the wild ones in their homes is no more difficult than photographing any other small objects at short range, the only difference being that they are so very responsive to every breeze that blows that we must

take their portraits at a time when the air is still.

There are many days, often many successive days, in late spring, in summer and in early autumn, when not a breath of air stirs the flowers before 8 or 9 in the morning, or after 5 in the evening, and it is during the early morning and late afternoon hours that the strongest light from the sky, on cloudy as well as on sunny days, reaches the flowers at an angle that lights them to far better advantage, for picture-making, than does the noonday sun.

Photographing wildflowers before an artificial background is an admirable way when, for any reason, it is desired to isolate them from their surroundings, but the



BLUE BELLS

pictures made by this method will tell us nothing about the homes in which they live.

In order to picture the wild-flowers among their home surroundings we must use the back-

ground provided by Nature, and such a ground sometimes may, for pictorial reasons, need a little cleaning up. It is often advisable to remove some of the weeds and the larger sticks and stones that



BLOODROOT

are close to the flowers, and also to remove such excess of the floral display as would prevent the picture from having a principal point of interest. The point of interest should always be monopolized by a few of the choicest flowers in the group.

The plants on which wildflowers grow and the homes in which they live are, with a very few exceptions, dark in tone, but the tone of the plants is usually either somewhat lighter or somewhat darker than their surroundings and will, in consequence, photograph either lighter or darker than the background against which they are seen. As a rule we need pay no attention to the tone value of the plant or the background, but we must consider the tone value of the different colored flowers.

Various as are the colors of flowers, these colors can be broadly

classed in three groups, which we will, for convenience, call the blue, the yellow and the red.

When we think of flowers we think of them as being visually brighter than their surroundings, and for this reason we want them to appear lighter than the background in our pictures. To do this we must consider how the colors will photograph:

Blue will photograph lighter than it appears and yellow darker than it appears to the eye, while red, unless it has a glossy surface, will photograph black.

An orthochromatic (yellow) color filter darkens the rendering of blue and lightens the rendering of yellow.

Red cannot be made to photograph in a light tone unless a red-sensitive plate is used with a special filter.

From what has been stated it

will be seen that all flowers, excepting those that are red, can be photographed, with any film camera, so they will appear lighter than the backgrounds Nature provides in the woods and fields, and that the way to do this is to photograph yellow and orange-colored flowers through an orthochromatic color filter, and to photograph violet and blue flowers without a filter.

Larger images can be obtained by using the Kodak Portrait Attachment, and when it is desired to use a filter also, this can be done by first placing the Kodak Portrait Attachment in front of the lens, and then fastening the front of the flange of the color filter to the front of the flange of the portrait attachment with a piece of binding tape, so the fronts of both attachments will face each other. When this is done care must be taken that the portrait attachment, and not the color filter, is placed next to the lens, or the picture will be out of focus. A pencil mark on the slotted flange of the color filter will identify it so it will not be mistaken for the portrait attachment when the two are fastened together.

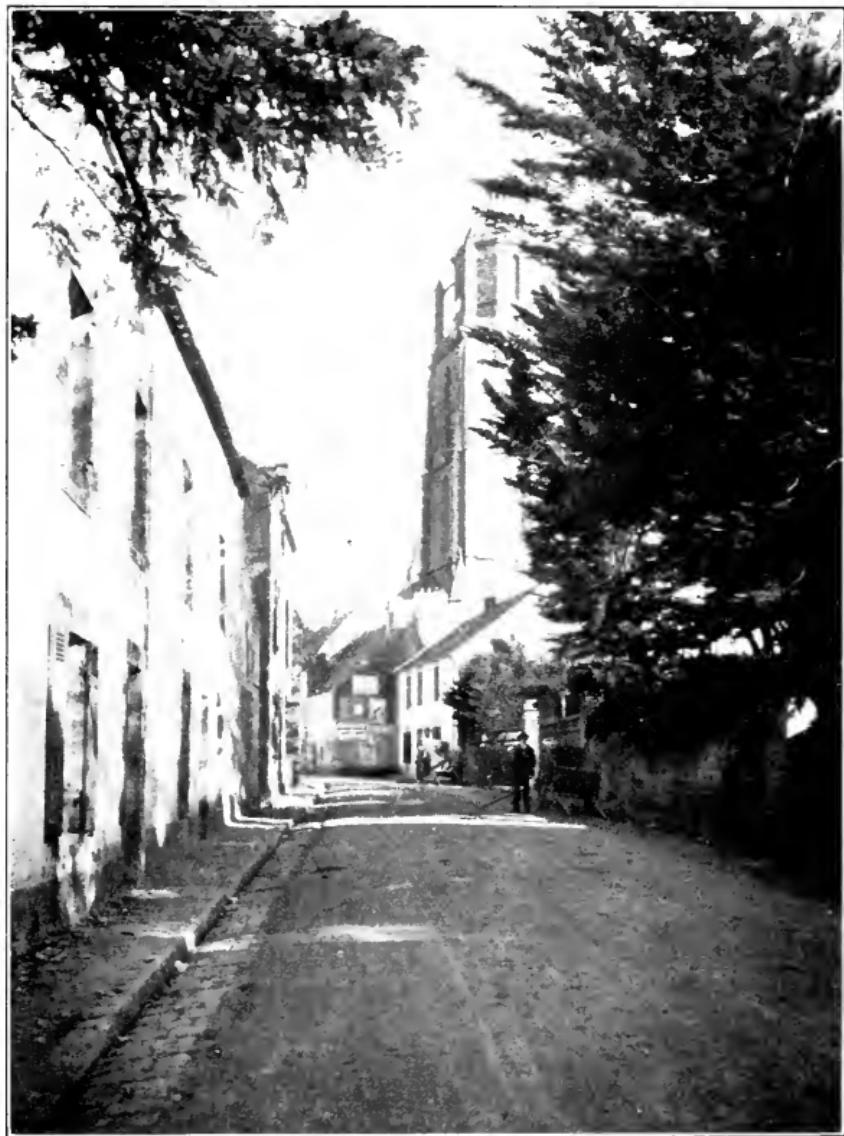
For flowers that receive the direct light from the sky, it is well to give fully four times as long an exposure as one would give, under similar light conditions for average landscape subjects. By placing the camera on a tripod, using the smallest stop and giving an exposure of one second, without a color filter, the writer has always obtained good printing negatives. With a Kodak Color Filter the exposure should be ten times, and with a Wratten K2 Filter it should be twenty times as long as when no



WILD BERGAMOT

filter is used. Any filter that records shadow detail in nearby objects with only three times the normal exposure, on anything but a red-sensitive plate, will not render yellow in a light tone.

A one second exposure without a filter is often a longer exposure than



A STREET IN BRITTANY

Made with a Premo

is necessary when direct sunlight reaches the flowers, but it is convenient to remember, and it gives results on cloudy as well as sunny days. Then again, the latitude of Eastman Film takes care of whatever excess of exposure this one second gives, and the excess exposure will be so slight that it will

do no harm, but it will insure the green of the plant being rendered lighter than the darker tones of the ground. The small stop increases depth of focus. Had the smallest stop been used for the Blue Bells, shown on page 11, all the flowers would have been as sharply rendered as the central group.



ACCORDING TO SUBJECT

BY LATIMER J. WILSON

IN a bookcase in a corner of the room is an interesting collection of photographs, so conveniently arranged that the owner knows exactly where he can find any one of the hundreds of prints he values. All these pictures are mounted in modern albums and each album contains pictures of certain kinds of subjects.

The title on each album indicates the kind of pictures the book contains. One is labeled "Summer Landscapes," another "The Camp in July, 1918," and still another "Biography of Charles, Jr."

Following the suggestion of the title, when the book is opened the pictures are found arranged in the order of sequence, thus, the "Biography" contains a complete pictorial record of the family pride and heir, from infancy through all the years of childhood.

It is the family intention to present this album to Charles, Jr., when he takes the responsibility of a family of his own, so that his children may delight in the pic-

tures that will tell the story of their father when he was a boy.

Albums of travel, of week-end outings, of social gatherings and of scenes in and about the home also have a place in the valued collection.

This idea of album utility makes the saving of one's photographs systematic, and all who make lots of pictures will find a satisfaction in knowing that each volume contains pictures of a particular kind of subject.

Whether you make few or many pictures each year, you will find that the best way to keep your prints is to mount them in albums where they will be well protected and can always be found when wanted.

By adopting a similar system with the negatives and indexing them so that they key with prints in the albums, reference to the print will indicate where the negative can be found—a very considerable help when further prints from a special negative are wanted.

SOME OF THE EARTS
ENCOUNTERED BY THE
ROVING KODAK



Lemon Merchant at Salonika
Photograph by Merle La Vay



A Holland Market Place



Lapland Women at Lyngen, Norway

S VARIED PEOPLES



A Tibetan Farmer



Native Chinese Women at Shanghai



East Indian Nurses and British Children

THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES

CHAPTER XIV—THE REPRODUCTION OF TONE VALUES IN THE PRINT

IT will be remembered that in Chapter X, it was pointed out that our object in photography is to get an accurate reproduction of the various tones or brightnesses which occur in the subject, keeping each tone in the same relative position in the scale of tones in the print as it occupied in the subject which was photographed. The more nearly this can be done the better will the print represent the original scene.

The making of a photograph is done in two separate steps: First, a negative is made in which all the tones of the original are inverted, the brightest part of the subject being represented by a dense deposit of silver and the darker parts by the more or less transparent areas in the negative, and then we print this negative and obtain a print in which the scale of tones is again reversed, so that they are now in the same order as in the original subject.

We have seen that the first of these steps, the production of the inverted scale of tones in the nega-

tive, can be accomplished perfectly, and that by exposing so that the whole subject which we are photographing is represented by silver deposits limited to the period of correct exposure of the negative material, we can correctly translate the tones of the subject into corresponding opacities in the negative and obtain a technically perfect negative.

When we come to the second step of the process, however, and make a print from this negative, we find that however carefully we choose our exposure and development *perfect* reproduction in the print is unobtainable. It will be remembered that in Chapter XI we found that for a negative material the relation between the silver deposit and the increase of exposure is given by a curve similar to that shown in Fig. 1, and that in this curve the straight line portion (B to C) represents the period of correct exposure, so that to obtain perfect reproduction in the negative we must expose so that the whole range of brightnesses in the subject falls within this period of correct exposure, none of the tones being represented by densities in the negative which fall on the curved portions at the beginning and end of the curve corresponding to the periods of under and over-exposure.

When we make a print, however, we cannot do this because in a print we are forced to use the whole range of reflecting power of the

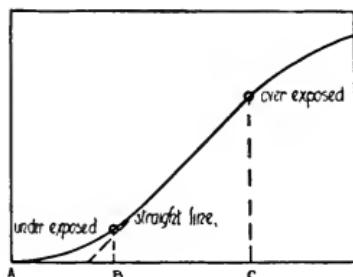


FIG. 1

printing paper; we must have highlights which are almost white paper, and shadows which are as black as the silver deposit will give. This is necessary because the total range of tones which can be obtained by reflected light is none too great for the reproduction of natural subjects, while in negatives, where the light is transmitted instead of reflected, the available range is enormous and we need make use of only a small portion of it. This is also true in the case of transparent positives such as lantern slides and motion picture films, which give the best rendering of any printing material.

We can try the effect of an increasing series of exposures upon a printing paper in exactly the same way as upon a film, that is, we can give a first exposure just sufficient to get a barely perceptible image after development, then expose another portion for twice the time, another for four times, and so on. We shall get on a strip of

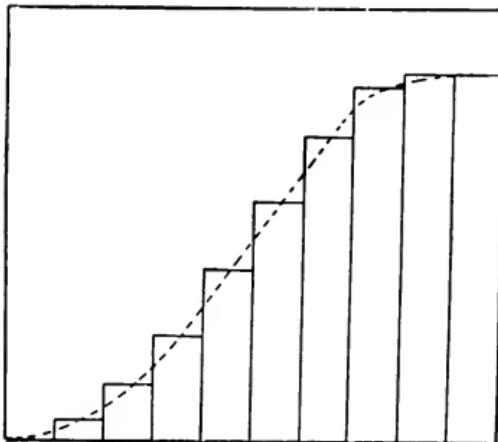


FIG. 3

paper the effect shown in Fig. 2. Now, instead of measuring the light transmitted by the various densities, as we did in the case of the film, we must measure the light reflected from them. We get a series of "reflection densities" on paper corresponding to the transmission densities of the film and we can express the result in the form of a curve just as we did in the case of the film.

Thus in Fig. 3 we see that the densities increase gradually at first, as shown on the lower portion of the curve, then grow in equal steps for equal increases of exposure, as with the film, and then the increase not only grows less, but very soon stops altogether, as shown by the upper portion of the curve. This result only occurs with a film with very great exposures indeed, since after a film begins to be overexposed there is still a considerable range of exposures before the increase of density with exposure actually ceases. Therefore, a paper is seen to differ from a film in that

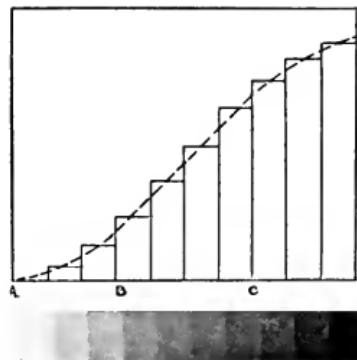


FIG. 2

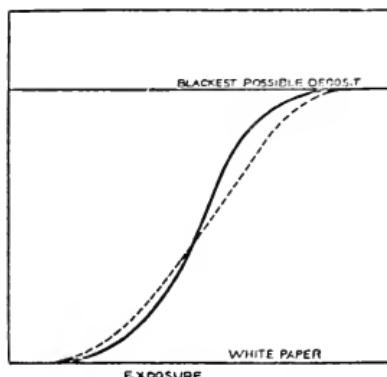


FIG. 4

we rapidly reach a point where we have obtained the maximum blackness of deposit which the sensitive emulsion is capable of giving and where no further increase of exposure will enable us to obtain a more intense black.

The reason for this is that with the paper we are dealing with reflected light, and not with transmitted light, as in the case of the film, and the light is reflected from three surfaces—from the surface of the gelatine, from the surface of the silver deposit, and that which is not absorbed in passing through the silver deposit is reflected from the paper beneath.

The rule for correct rendering of tones on the paper is the same as for the negative; that is, the tones which fall on the straight line portion of the curve are rendered correctly, and those which fall on the top and bottom portions of the curve do not reproduce the tones of the negative in their correct position. As has already been said, however, the difference is that in the negative we can generally con-

fine the scale of the subject to the straight line part of the curve, while in printing we are forced to use the whole curve, including those portions which cannot give a perfectly correct rendering of the tones of the negative.

Different papers sometimes show very different curves; thus in Fig. 4 we see the way in which two different papers give their scales of tones; both give the same range of tones, both require the same range of exposures to give the entire range of tones, but in the one the deposit grows evenly with the increase of exposure while in the other the curve is scarcely straight at all. The paper showing the even growth of deposit will give a correct rendering of the tones of the negative throughout the greater part of its curve (shown by dotted line in Fig. 4), and it is generally said that such a paper has good "quality" while the paper with the uneven growth (solid line Fig. 4) has poor "quality." For papers, therefore, as well as for negative-making materials, quality depends upon the proportion of the curve which is a straight line, and the straighter the curve the better the quality.

It must be remembered that the scale of exposures required to give the full range of deposits on a given paper is not an indication of quality but only of the contrast of the negative to which that paper is adapted. As was shown in the last chapter papers have different scales for use with different negatives, but any paper which gives its scale evenly is of good quality, whatever that scale may be.



LOADED TO CAPACITY
Made with a No. 1A Kodak Junior



A STATELY ENGLISH DRAWING ROOM

Made with a 3A Folding Kodak

THE NEGATIVES FROM WHICH WE HAVE NO PRINTS

THE old saying, "keep a thing for seven years and you will find a use for it," is especially true of many photographic negatives from which the owner has no prints, and it is a wise precaution never to throw a negative away unless it was hopelessly underexposed.

The discovery of a new process or an increase in our knowledge and skill may at any time enable us to make prints from negatives we had considered useless.

The writer has dozens of old negatives, that were made long before the day of tank development, which were either so much under or over developed in the tray that they were not suited for any of the papers that were on the market at the time the negatives were made.

When the first development paper was introduced good prints were obtained from some of these negatives, and later, when development papers were made to fit negatives of various ranges of contrast, nearly all the incorrectly developed negatives acquired a positive value.

But aside from incorrectly developed negatives, there are lots of others, in nearly every collection, from which the owner has no prints. It may be that all the prints were given away, or the negatives may have been laid aside after development with the intention of doing the printing at some more convenient time.

Many of us who make some negatives for purely record purposes, such for instance, as a pictorial souvenir of the old mill that

is going to decay, or the old landmark that is soon to be removed, have learned that the records these negatives contain are always likely to prove more interesting in after years than at the time they were made.

Portrait negatives, whether of one individual or of a group, should always be preserved. The time will

certainly come when they will be wanted.

By going through your files you will be sure to find some negatives of which you have no prints, and it will be just these prints that you will want for your album, which is the only place where they can be kept with the certainty of being found when they are wanted.



THE YACHTSMAN
Made with No. 1 Kodak Junior

CAMEO PORTRAITS

SINCE the article entitled Photographic Cameos was published (in the February KODAKERY), some of our readers have inquired if the process we described is suitable for portraiture.

Making cameos by photography is a stunt which produces unique effects and, while pleasing cameo portraits can easily be made, it

should be remembered that any photograph of the human face that shows any addition to or any subtraction from, the lines and dots of which the image in the negative is composed, will make a decided change in the likeness.

In making cameos we get white and also black lines in our pictures (see illustrations) which we cannot find in the negatives. These lines are the result of the "offset" printing on which the cameo process depends, and they appear as borders along the strong lights and the deep shadows.

Such lines cannot be introduced into any portrait that shows both eyes without producing a result that is apt to be grotesque rather than pleasing, but they often can be introduced into a portrait that shows only one of the eyes—a full profile picture—with very pleasing results.

The width of these white and black lines depends solely on how much the positive is out of register with the negative, and the effect obtained depends, both on the width of these lines and whether



Print from Original Negative

the white line appears in front of or behind the head.

As was explained in the February KODAKERY, the way to make a photographic cameo is to make a film positive (a print on film instead of on paper) from the negative, in a printing frame, then place this positive over the negative and a sheet of Velox paper over the positive, and make a print in the ordinary way.

Whether the positive is made on Eastman roll film, or on Eastman Film Pack Film, it is best to develop it with the same kind of developer that was used for making the negative, so that the printing quality of the positive will be the same as that of the negative.

Eastman roll or Film Pack Film, can of course be safely handled by ruby light, such as that obtained with a series 1B or 2 Wratten Safelight used in any one of the safelight lamps made for the purpose, exercising the same precautions that are necessary when ordinarily developing film in the dark room.

The ideal positive is one that has the same density as the negative. When all parts of the image in such



Cameo effect obtained by placing white line in front of face

a positive are in exact register with the corresponding parts of the image in the negative the two images will neutralize each other so that no image can be seen when we try to look through the two films.

By placing the positive slightly out of register with the negative we can see the "offset" which forms the image that is translated



The result of placing black line in front of face

into a cameo by printing it on Velox paper.

When the positive is of greater density than the negative we will obtain a partly negative image, which would probably be of no use to us, but when the positive is of lesser density than the negative we will always get a print that shows a positive image, and from positives that are of the same density, or of varying degrees of lesser

density than the negative we can obtain unique and interesting "cameos."



CHEMICALS

ALL developers are chemical preparations, and the quality of the results that any developer can produce depends on the quality of the chemicals of which it is composed.

Unless the chemicals are always of the same strength and purity the photographer can never tell what the quality of his negatives or prints will be when he uses another package of any chemical, or another package of any chemical preparation.

All Kodak chemical preparations are compounded with

the utmost accuracy and they are composed of Kodak Tested Chemicals—chemicals which have been rigidly tested for strength, purity and uniformity.

Since all Kodak Tested Chemicals conform to a fixed standard their efficiency does not vary. They are uniform in quality and they produce uniform results, thus protecting the photographer against waste of time and material.

LET US DO FOR YOU WHAT WE HAVE DONE FOR OTHERS

THE first number of KODAKERY, published in 1913, invited its subscribers, and all other amateur photographers, to write us regarding any photographic problems that they encountered.

This invitation was instantly accepted by so many amateurs that we have made it permanent, and, as a result, we have, during the past five years, taught many thousands of photographers how to make the kind of pictures they want.

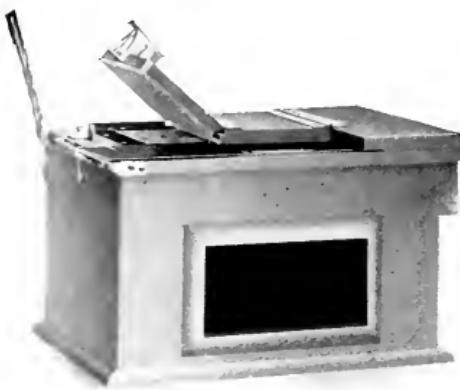
The following extracts, from two letters, are typical of the comments we are constantly receiving from those we have assisted:

"I am much impressed with your demonstrations of service. I must thank you for what might be termed the personal tone of your advice."

"I also desire to express my appreciation of your courtesy, and effective response to my plea for help."

We will take pleasure in giving you this same service. If you need assistance in picture-making write us a detailed statement of your problem. If your negatives or prints are not satisfactory, send them to us, with full information regarding exposure and development. Whatever your photographic problem may be we will help you solve it. There is no charge for this service.

Address all Communications,
"KODAKERY," CANADIAN KODAK CO., LIMITED,
TORONTO, CANADA.



Kodak Amateur Printer

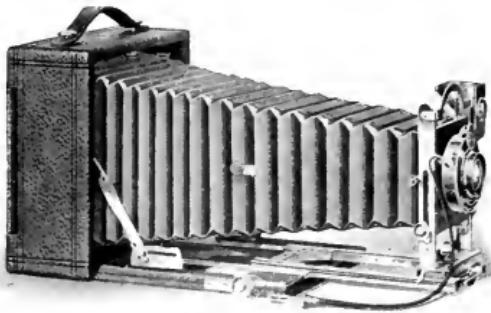
Price, 7.50

The argument for the Kodak Amateur Printer is a simple one. It is easier—much easier—to get good prints with it.

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PROVIDES all of the adjustable features that are so helpful in bird and flower photography. Whatever the conditions may be, you can suitably arrange the size of image, composition and focus.

The Premo No. 9 is furnished in three sizes— 4×5 , $3\frac{1}{4} \times 5\frac{1}{2}$ and 5×7 , varying in price according to the choice of lens equipment.

*Premo Catalogue free at your
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Negative Album

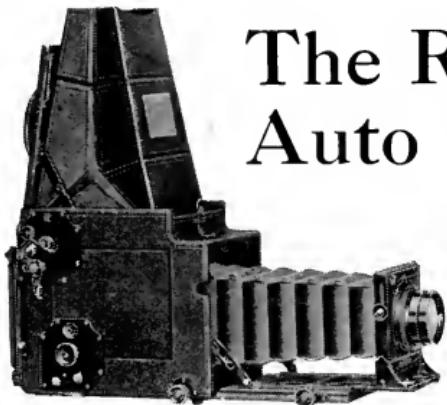
In the pictures made now-a-days when "Johnnie comes marching home" and in the pictures made during the months before the armistice was signed, the date is a very important part of the story, and the importance of the date makes it highly necessary that the autographic negative containing it should be properly housed.

Eastman Film Negative Albums afford a safe, convenient and efficient way of keeping film negatives. Each leaf is, itself, an envelope, and as a result, the negatives do not come in contact with each other.

THE PRICE

For 100 negatives, $2\frac{1}{2}$ x $4\frac{1}{4}$, or smaller	-	\$1.00
For 100 negatives, $3\frac{1}{4}$ x $4\frac{1}{4}$, or 4 x 5	-	1.25
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CANADIAN KODAK CO., LIMITED
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The R. B. Auto Graflex

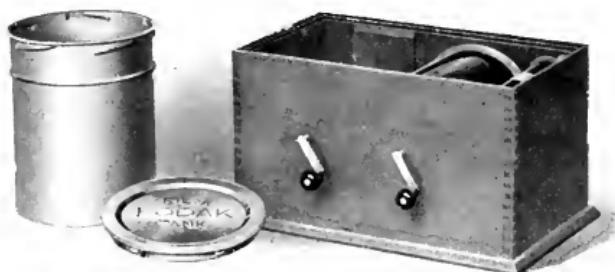
You see in full picture size, right side up, every picture you take—as you take it. There is an ease and certainty in getting the required composition and focus with a Graflex that gives added pleasure to picture making.

The effective combination of the Graflex Focal Plane Shutter and high speed lens assures pictures of any subject under any condition when photography is possible.

General view, as well as close-up work essential to the naturalist, are provided for with the bellows capacity of the Revolving Back Auto Graflex.

*Ask for the 64-page Graflex Book
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Kodak Film Tank

GIVES you better
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Price, **\$3.00** up

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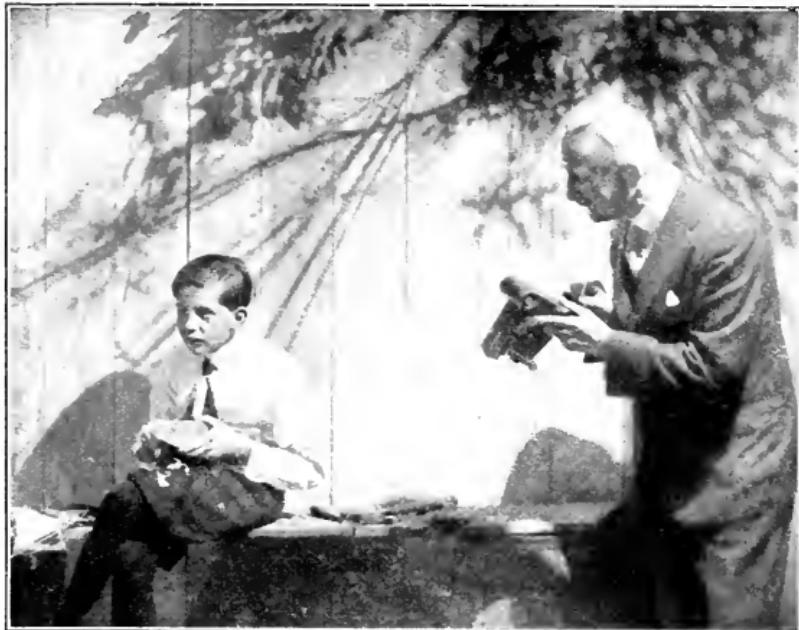
VELOX

a Photographic paper that fits
any amateur negative.

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At your dealer's.

Make the Kodak Record Autographic



For the Days to Come

BUILDING his boat of pine and dreaming, as he works, of the days when he will sail a real ship on a real ocean—a regular boy, that.

And Dad, with his Kodak, has caught the boyish story. Now he is writing the autographic record—the date and title on the film; the record that will give double value to the picture when time has played sad tricks with memory.

Make the family chronicle complete. Let every picture of the children bear at least a date. It's all very simple, as simple as taking the picture itself—with an

Autographic Kodak

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

KODAKERY

A
MAGAZINE *for* AMATEUR
PHOTOGRAPHERS



AUGUST 1919

CANADIAN KODAK CO., LIMITED,
TORONTO, CANADA.

*If it isn't an Eastman,
it isn't a Kodak*

EVERY article of real merit sells best under its real name.

If it is genuinely good the salesman has no reason to camouflage its identity by giving it the name of a competing article.

When you ask at the store for a Kodak camera, or Kodak film, or other Kodak goods and are handed something not of our manufacture you are not getting what you specified, which is obviously unfair to you.

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JUNE TROPHIES

W. A. G. & L. F. (Lester K. and)



PUBLISHED MONTHLY—YEARLY SUBSCRIPTION, 50 CENTS; SINGLE COPIES, 5 CENTS.

VOL. VI

AUGUST, 1919

No. 10



THE CREEK
Made with a 2.4 Cartridge Premeo

WHEN SUMMER COMES

BY CHESTER CRAIG

WHEN we go for the first time to California or to certain retreats lying southward, and discover for ourselves that seasons do not mean the same thing in all quarters, there is a novel thrill. The fact is that literature fixes traditions in our minds, and poetry's spring and summer hold our imaginations.

Since I have a northern bringing up, the notion that Nature is asleep in the winter holds fast, yet it happened that photography more than travel has helped to keep me reminded that there are places where flowers bloom all the year round.

However, June roses are June roses. And my hens insist that it



ON GOOD TERMS
Made with a 2.1 Brownie

is going to be summer soon. And the boats go into the water. My Kodaks (there are three of them) also know that it is going to be summer, and there will be more days of bright light and longer light—no getting away from that *longer* light part of the summer advantage for the Kodak. Yesterday I

photographed a returned soldier boy *after* leaving the office at five o'clock (so much for daylight saving).

After all, the great point about summer for the average of us is that it is the outdoor time, country time, sea-shore time, picnic time, adventure time, and in certain special and profuse ways, Kodak time.

But maybe I'm an optimist—and a true optimist thinks each season is best of all, when it comes. Pictorially there is entire reasonableness in this. Just as a painter turns his canvas to the wall for a time in order that he may come at it freshly, so the alternation of the seasons gives us an opportunity to get fresh impressions of each.



SCOUTING
Made with a Vest Pocket Kodak

ALMOST MOVIES WITH A KODAK

Illustrated with 34 Kodak Pictures

YOUNG children are always doing something, and the "something" often furnishes an interesting motive for a picture.

A child at play is enacting a scene which can easily be recorded by the camera, and if a series of such camera records are made within a few minutes of each other the result will be a sequence picture, that is, a picture which shows various incidents in the scene that was being enacted. Such pictures can be made with any kind of camera.

Our illustrations of the child and the dog suggest the possibilities of this kind of work, which is just as easy as the making of a single outdoor portrait.

Snapshot exposures are needed for photographing children at play, whether they are in sunshine or in shadow, and, in order to avoid recording any slight movement they may make, it will be necessary to photograph them on a bright day while they are out under the open sky, preferably in the shade of a building, but never in the shade that is under the roof of a porch or under the branches of a tree.

With cameras that have double lenses (those that have a lens in front of the shutter) an exposure of $\frac{1}{25}$ of a second with stop 4 on rectilinear lenses, or



stop f.8 on anastigmats, is recommended, when the sun is shining, and, with single lens cameras (those that have no lens in front of the shutter) the largest stop should be used and a snapshot made, also when the sun is shining.

It should be noted that the conditions call for sunshine and shadow—the subject to be in the shade with nothing but the sky overhead.

In making sequence pictures of children never expose a film when they are looking at the camera or at the photographer. Sequence pictures are intended to tell a story—the story of what the subjects

are *doing*, and the most successful sequence pictures are those that suggest the subject was wholly unaware that the pictures were being taken.

The prints should, unless some feature of the action suggests a different program, be mounted in the order in which the negatives were made.

If lantern slides are made from such a series, an effect closely approximating a "slow movie" may be produced on the screen. It was precisely in this way that the first "picture plays" were made and presented twenty-five years ago.



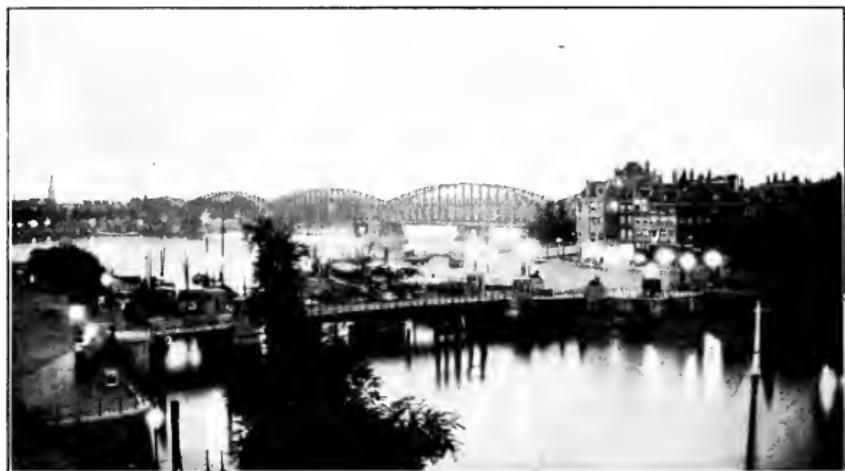
RECONNOITERING

Made with a Kodak



COWBOY DEXTERITY

Made with a 3.1 Folding Kodak



Made by Miss L. Konzelman, at 8.30 P. M., in July;
exposure, 15 min.; stop, 16

EVENING TWILIGHT PICTURES

IT sometimes happens, especially when we are away from home, that the only time for photographing a particular scene, or a special effect in landscape lighting, comes during the evening twilight—a time of day that few of us utilize for picture-making.

The fact that the sun has set and daylight is departing need not bother us; if there is daylight enough for making an object visible there is light enough for impressing the image of that object on the film.

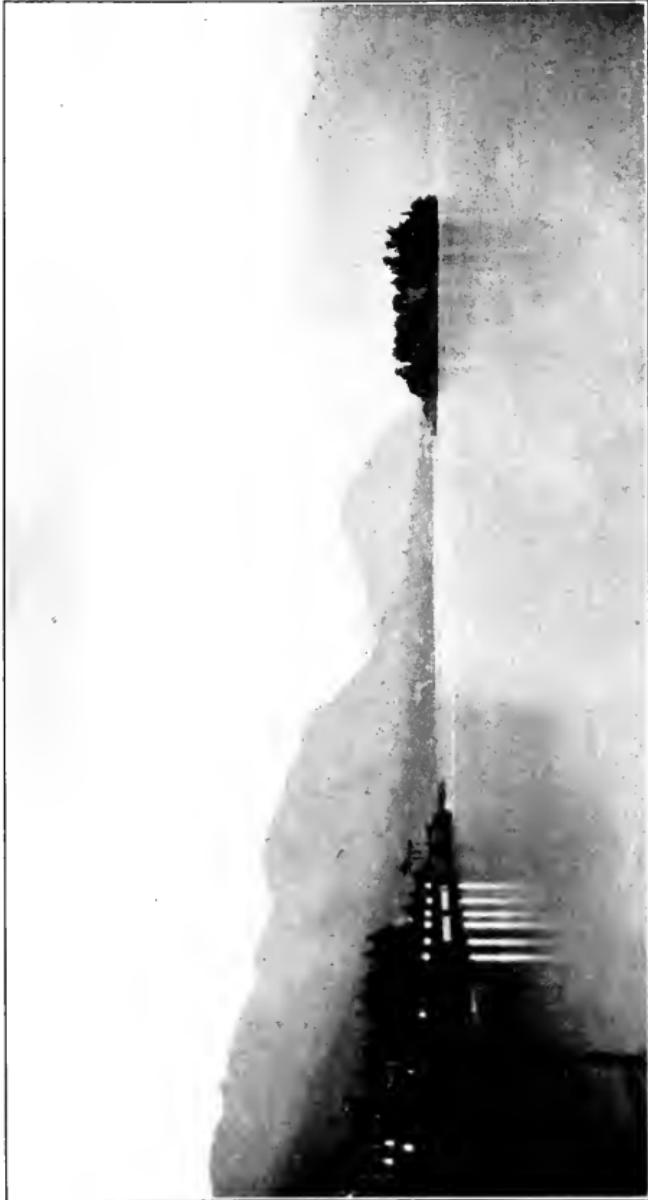
When the light is weak we make time exposures, and in so doing we subject the film to the cumulative action of light. The effect that the cumulative light produces on the film is so much greater than the effect it produces on the human eye that when a very weak light acts on a film for a long time it will record, not only what we can see, but also

much that we cannot see in our subject.

Those who have never made photographs under conditions that were favorable for demonstrating this fact may be surprised to know that Miss Konzelman made the picture which is reproduced above, at about half-past eight o'clock at night, in July of 1914.

If no lighted arc lamps had been included in the field of view the picture would contain no evidence of having been made near the close of the twilight period.

Time exposures, with the camera on a tripod, are needed for making twilight pictures, and we would suggest that stop 4 on rectilinear, or stop f.8 on anastigmat lenses be used, and an exposure of $\frac{1}{5}$ second be given at sunset, and a one second exposure at 15 minutes after sunset.



Make by W. B. Harris, at 8.30 P. M., in August; exposure, 10 min.; stop, U. S. 8

The length of exposure must increase as the twilight deepens until, near the close of the twilight period, the exposure needed will be fully 10 minutes.

These suggestions regarding exposure must not be considered as rules, for it would be difficult, if not impossible, to work out any convenient rule for twilight work, because the length of twilight varies during the different months and also at different latitudes.

Our suggestions regarding exposure are based, both on the

writer's experience and on a careful examination of the negatives from which Miss Konzelman's picture on page 8 and Mr. Harris' picture on page 9 were made.

It is certain that good results can be obtained in twilight work with considerably longer exposures than those we have suggested for later than 15 minutes after sunset.

When the largest stop is used on single lens cameras the exposures should be about twice as long as those we have mentioned.



WHEN WAS THE PICTURE MADE?

BY PHILIP MONTROSE

SOME five years ago when the Booths were over for the evening, I showed them an old snapshot I had made of Jimmie. Incidentally, Jimmie is about the cutest little chap in the world. They were both properly enthusiastic and then they both asked in one breath, "How old was he when the picture was taken?" I guessed "Three years," The General (that's my wife) guessed "Less than two years, you silly." We both insisted we were right—as a matter of fact neither of us was sure.

Isabelle has arrived since then. Incidentally, Isabelle is about the cutest little girl in the world. The Booths thought so, too, when I showed them some pictures I made of her a year or so ago. They asked "How old was she when the pictures were made?" The General and I answered in one breath

"Two years, three months," because there the information was on the film margin just where I had put it at the time I made the pictures. You see I had used an Autographic Kodak.

It's my experience that the date is just about as important as the picture, itself, when it comes to snaps of the youngsters. In any event, I have noticed that the inevitable question when such pictures are displayed is "When?"



From a Vest Pocket Kodak picture

BLACK IMAGES OF LIGHTNING

OUR readers occasionally send us photographs of lightning flashes that show short black lines branching off from the white line which represents the main flash, and they have asked us to explain why these lines, which obviously represent a part of the lightning, appear black in the picture.

Some have wondered if these black lines might not represent lightning of a different color than the main flash—some non-actinie color, such as deep red for instance, which made no impression on the film.

We doubt that such is the case, because it is well known that the right amount of excessive over-exposure will produce a positive instead of a negative image on a film or plate.

While such excessive over-exposure rarely occurs when pictures are made by daylight, it often does occur when pictures are made by electric light at night, when lighted arc lamps are included in the field of view.

Many photographs of night scenes have been made that show, as does Mr. Patterson's picture on page 12, a black dot near the center of the white area that indicates the location of a lighted arc lamp. This black dot is a reversed image of the arc, and the reversal is due to the fact that the light of the arc itself is so much more intense than the light reflected from other objects in the field of view that the exposure needed for recording the other objects proves to be a several thousand times over-exposure for the arc.



*Made with a 3A Kodak, by
Harry M. Palmer*

When several lighted arc lamps are included in the picture of a night scene some may show reversed images while others do not. When a picture shows a reversed image of an arc that is near the camera, and images that are not reversed of arcs that are farther away, it is probably because the light that reached the film from the farther arcs was not intense enough to produce reversal*. But when it happens that the arcs nearest the camera do not show reversal while those that are farther away do show it, it is probable that a second reversal has taken place, so that the image in the film which was reversed from negative to positive was again reversed from



The U. S. Capitol illuminated by Army searchlight and showing instances of black spots in center of intense light. Made by A. L. Patterson; exposure, 6 min.

positive to negative, the reversals occurring alternately when the exposure is sufficiently prolonged.

The black lines that branch from the main white line in pictures of lightning are likewise reversed images, but they are obtained by instantaneous instead of by time exposures.

Reversal of a lightning flash is believed to be due to what is known as the "Clayden effect," Clayden having discovered that a sudden flash of intense light may produce a reversed image of the type shown in Mr. Palmer's picture on page 11.

The reversal in such a case is a reversal of the first exposure from the main flash, which lights the sky sufficiently to produce a general illumination of the sky, and then the subsequent flashes reverse the image and appear black against this background.

While the flashes that produce the Clayden effect may occur in such rapid succession that they will appear as a single flash to the observer, they are, nevertheless, separately recorded by the film.

The condition for obtaining such reversal is an extremely short in-

tense exposure, such as is obtained from an electric spark or lightning.

Lightning flashes can be photographed at night by placing the camera on a tripod with the lens pointed toward that part of the sky

in which the flashes are seen. The shutter is opened for a time exposure and left open until a flash occurs. It is then closed and another section of film reeled in position for the next flash.



CAMERA STUDIES OF THE WHIPPOORWILL

BY HOWARD TAYLOR MIDDLETON

Illustrated by the Author

TN a secluded glade, shaded by mighty oaks, and vocal with the song of the wood thrush and the murmur of a distant brook, we chanced upon Mrs. Whippoorwill. She was sitting upon her eggs and did not notice us nor did we see her until the distance between us was a scant three feet. Then she flitted skyward noiselessly as an owl and we saw her no more—for a time.

"A whippoorwill at last!" cried the little wife excitedly, "and what a chance for a picture."

"We'll set up our Kodak on a stake, using the Optipod, and get a time exposure of the eggs," she continued. "This accomplished, we'll attach a thread to shutter release and shoot her with the camera from a distance after she returns."

It was the work of a very few minutes to cut a stake with my axe, sharpen one end and drive it in the ground. Then the camera was clamped in place and the eggs, very beautiful with their dainty scrolls of lilac on a white ground, photographed. The exposure was two seconds, stop 16.

Now we were confronted with the more difficult problem of procuring a picture of the bird, provided she was considerate enough to come back.

We covered the camera carefully with sprays of oak leaves, and carrying the thread with us, crept behind some bushes about ten yards from the improvised studio.

We were skeptical about our chances for a successful portrait because of the poor light. "If the bird becomes startled and moves at the click of the shutter, we are lost," exclaimed Marie. "If she sits tight we win."

After what seemed to us a very long time, she appeared upon a limb above the eggs, and perching there, remained absolutely motionless. So perfect was her protective coloration that it was difficult in the extreme to distinguish her from the foliage which surrounded her.

"Do you see her now?" asked Marie suddenly after we had been watching for awhile.

"I'm not sure," I replied after a long look.



Owing to its protective coloring, which resembles the colors of the ground on which the Whippoorwill often spends the day, few visitors to the forest find the bird when it is at rest

"I cannot see the eggs any more and I believe she is on them."

I glanced hastily at the spot in front of the camera where the eggs should be. They had vanished from sight.

"There is nothing there that bears the least resemblance to a bird; the wind has probably blown some leaves over them," I suggested.

"We will play safe," came the emphatic command. "What's a film where a wonderful picture is concerned? pull the thread."

I obeyed orders, but nothing happened.

"I guess you're right about the leaves," admitted Marie, and her

voice showed her disappointment. "Uncover the eggs, please."

I had taken three steps forward when the bird fluttered away. We had a picture, but as usual when one portrait is ours, we long for another to surpass it, so we set to work upon ways and means to procure a dramatic pose of Mrs. Whippoorwill.

"I have it, partner," exclaimed Marie after a moment's deep meditation. "Did you notice that she paused for just an instant after uncovering the eggs? Let the camera remain as it is, but change the shutter speed to $\frac{1}{2}$ second and use the largest stop. When she returns I will have my hand on the



When disturbed while sitting on its eggs the Whippoorwill flounders about the ground, and when the intruder has been lured away from the eggs it flies away

thread while you creep toward her. We'll take a chance on her pausing once more."

The changes were soon made and we were in our ambush again.

In a half hour she came back, flying directly to the eggs, where she sat and dozed, her big eyes half shut.

Stealthily I began my stalk. At ten feet she opened her eyes and became nervous, at six feet she moved off the eggs and made a face at me, opening her enormous mouth and hissing faintly. It was then that I heard the two clicks as the shutter opened and closed; Marie had pulled the thread. At my next step the bird left the

ground and soared away over the tree tops in silent flight.

We were not fortunate enough to procure a photograph of the young whippoorwills, and if you ask Br'er Possum he can tell you why.



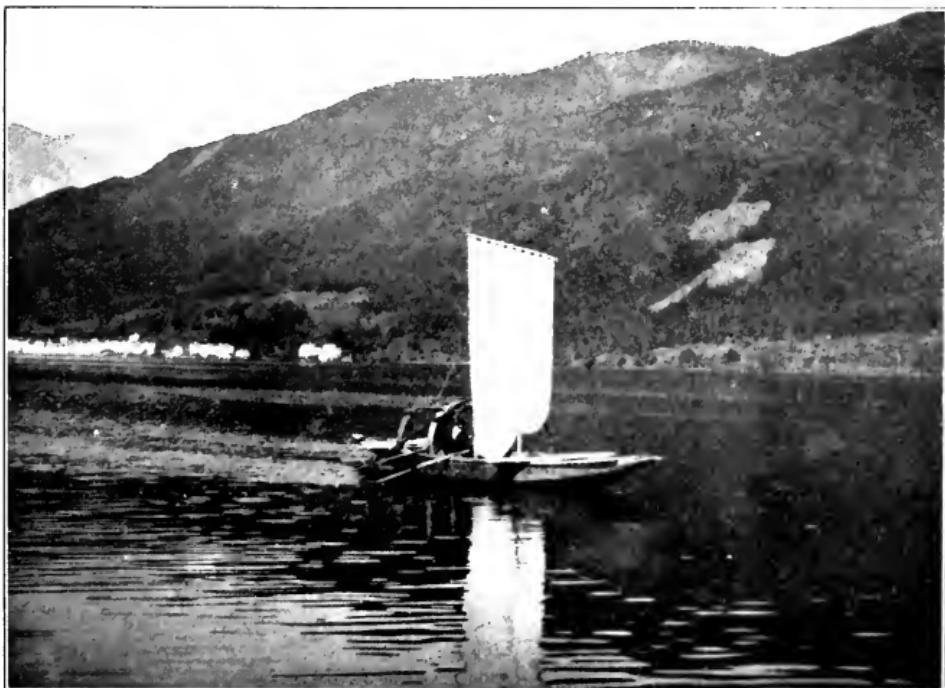
Experience is needed for correctly developing a negative in the tray. All that is needed for correctly developing a negative in the tank is to do what the tank instructions recommend. A child can do this.

SOME ANCIENT
AND
MODERN MODES
OF TRAVEL

□

RECORDED
BY
THE CAMERA





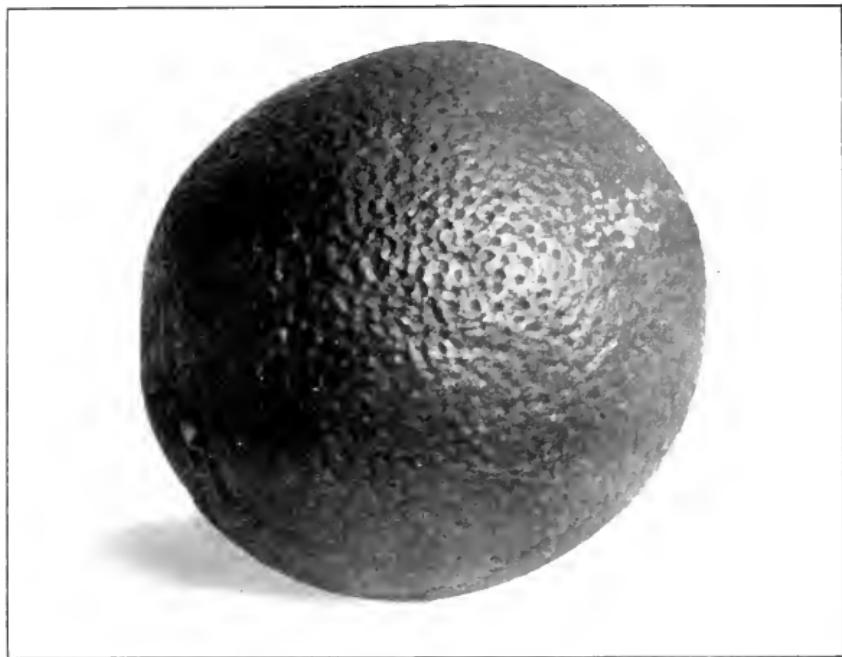


FIG. 1

THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES

CHAPTER XV—THE NATURE OF COLOR

If we take a piece of blue cloth and put an orange on it and then photograph the combination we shall find that instead of the orange being lighter than the cloth, as it looks to the eye, the photograph (Fig. 1) shows it as being darker. This difficulty in photographing colored objects so that they appear in the print in their correct tone values, as they are seen by the eye, has been well known to photographers from the earliest days of the art.

In order to understand the cause of it let us consider the nature of

color itself. When we speak of a colored object we mean one which produces a distinct sensation, which we call the sensation of color. This must, of course, be due to some change in the nature of the light which enters the eye and causes the sensation of sight, and this change must be produced in the light by the colored object so that the light after reflection from the colored object is different in composition from the beam of light before reflection.

The composition of a beam of light is analyzed by passing it

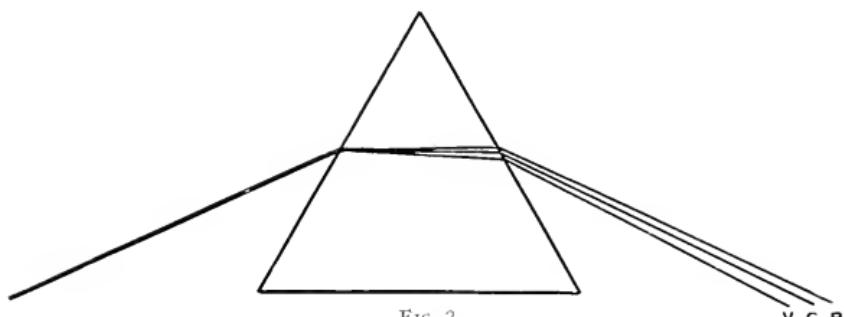


FIG. 2

through an instrument called a *spectroscope*, and this may be nothing more than a piece of triangular glass (Fig. 2), which is called a *prism*. When a beam of light is passed through a prism it is bent, and Sir Isaac Newton once found that a narrow beam of sunlight falling on a prism is not only bent but it is split up into a colored band of light. In order to understand this we must remember that light is composed of waves, these waves being of very short length and occurring not in the air but in a medium which is supposed to pervade all space and which is called the *ether*. In white light there are waves of all lengths—short waves and long waves mixed indiscriminately—but in certain proportions. The amount which the beam is bent depends on the length of the waves, the shorter ones being bent more than the long ones, and consequently the prism sorts out the waves of light so that in the band of colored light the short ones are bent the most and the long ones are bent the least.

The length of the waves is associated with the color of the light; the longest ones which the eye can see are red, and if we measure them in the very small units which are

used for measuring waves of light we shall find that the red waves are 700 millionths of a millimeter, the yellow ones are 600, the green 550, the blue-green 500, the blue 450, and the violet waves, the shortest which we can see, are 400 millionths of a millimeter long (Fig. 3), so that the prism sorts out the light waves according to their length, bending the beam of shortest wave most and thus bending the violet wave most, and the longest or red wave least. Thus, we can scale this colored band, which is called the *spectrum* by the length of the light waves of which it is composed (Fig. 4).

If we take a piece of colored glass or gelatine, say pink gelatine, and

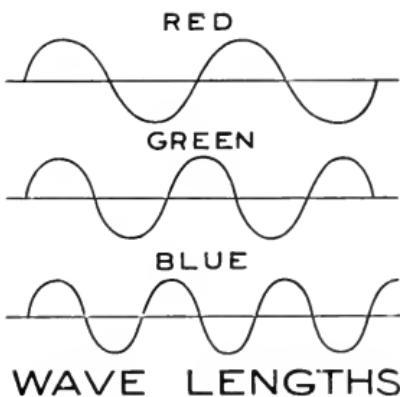
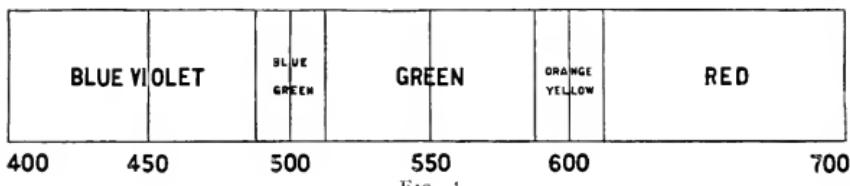


FIG. 3



hold it between the prism and the spectrum, we shall find that the pink gelatine will not let some of the waves of light through; it will stop them completely, while it will let the other waves through without any difficulty. The pink gelatine, in fact, cuts out or absorbs the green light (Fig. 5). *This is because of its pinkness*; that is, it has the property of absorbing green light from the white light and of letting through the other light which is not green, that is to say, to a less degree this pink film sorts out the light just as the prism does, but instead of separating the waves of different lengths it stops some of them and lets the others go on, and the eye, missing those which are stopped, records the absence as a sensation of color.

If, instead of having a transparent substance like film, we have an opaque colored object, like a sheet of orange paper, and let the spectrum fall on it, we shall find that the orange paper will reflect the red and yellow and green light but will refuse to reflect the blue

light; it absorbs it, and its orange-ness is due to the fact that it absorbs the blue light and refuses to reflect it so that all objects which are colored are colored because they have some selective absorption for some of the waves of light; they do not treat them all alike but reflect some and absorb others, and the modified light which reaches the eye we call "color." Any object which treats all the waves of light alike, which absorbs them all or absorbs them equally or reflects them all in equal proportion, is not colored. If it absorbs them all it will be dead black since it will reflect no light. If it absorbs them to a small extent, but equally, it will be gray; if it reflects them all it will be white, but if it absorbs some of the wave lengths and not others, it will be colored.

If we try a series of experiments in our spectrum we shall find that things which absorb red light are colored blue, and those which absorb green light are colored pink or magenta, or if they absorb a great deal of the light, purple (Fig. 6).

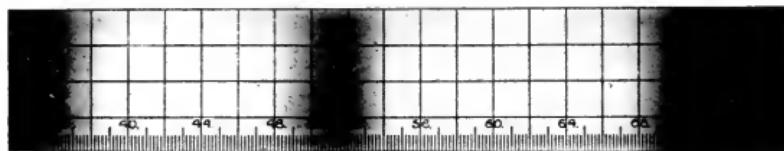


FIG. 5

A pink filter passes the violet, blue, yellow, orange and red rays, but absorbs the green



FIG. 6

A purple filter passes the violet and red rays but absorbs the blue, green, yellow and orange

Those that absorb blue-green light are orange, and those that absorb blue-violet light are yellow. We

see, then, that to each color there corresponds a region of the spectrum which is absorbed.



THE PICTURE JUST OVER THE PAGE

JUST before or very soon after sunset, at any time of year, a picture of the type shown on

page 22 can be made with any kind of camera. An ordinary snapshot, or $\frac{1}{25}$ sec., stop 16. No filter needed.



RED CROSS NURSES IN BELGRADE, SERBIA

From a Graflex photograph by Donald C. Thompson



HAMPSTEAD HEATH, ENGLAND, IN SNOW TIME
Made with a 3A Folding Kodak

MIXING THE TANK DEVELOPER

THE Tank Developer Powders that are prepared for use in the Kodiak and Premo Film Tanks are put up in wrappers, each of which contains two packages of chemicals. These chemicals are pyro, sulphite of soda and carbonate of soda. The pyro is in the thin package and the sulphite and carbonate are in the thick one.

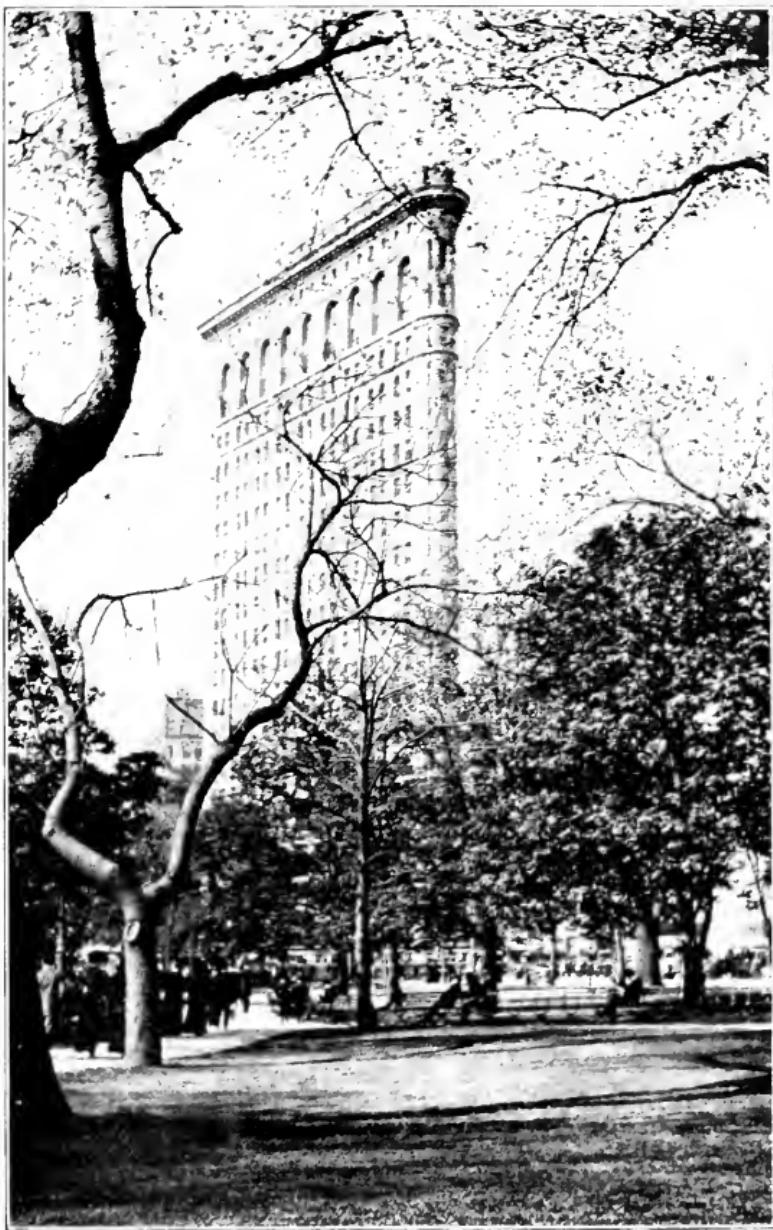
In preparing the developer it is important that the sulphite and carbonate should be dissolved first, and they should be wholly dissolved before the pyro is added to the solution. Should the pyro be dissolved first and the sulphite and carbonate be added to the pyro solution, undissolved carbonate of soda would come in contact with the pyro and turn the developer brown. A pyro developer should be almost as colorless as water,

until after it is used. If it is brown when the negatives are placed in it it will stain them deeply.

A slight stain, in only those parts of the negative that contain reduced silver, is not objectionable, in fact such a stain often improves the printing quality of a negative, but a deep stain, which extends over the whole film, is a detriment.

A slight stain, in the silver only, has a selective action which adds snap and brilliancy to the prints, but a deep stain, which colors the gelatine as well as the silver, has no selective action. It does no good and only makes the negative a slow printer.

A deep stain will never be found in negatives that were developed with Kodak Tank Powders in a Kodak Film Tank, or with Premo Tank Powders in a Premo Film



"THE FLATIRON," NEW YORK
Made with a Kodak

Tank, if the following instructions, which are furnished with every tank, are observed:

Have the film ready for developing before mixing the developer.

Dissolve every particle of the sulphite and carbonate before adding the pyro.

Do not let the prepared developer stand exposed to the air, but use it as soon as it is mixed.

Lock the cover on the tank as soon as the films are placed in it, so that no air can enter the tank during the process of development.

Wash the films in three changes of water between developing and fixing.

Leave the films in the fixing bath a few minutes longer than it takes

to remove the last trace of the creamy color. This is necessary for removing an *invisible* salt that is formed during the first stage of the fixing process, which, if not removed, would ultimately ruin the negatives.

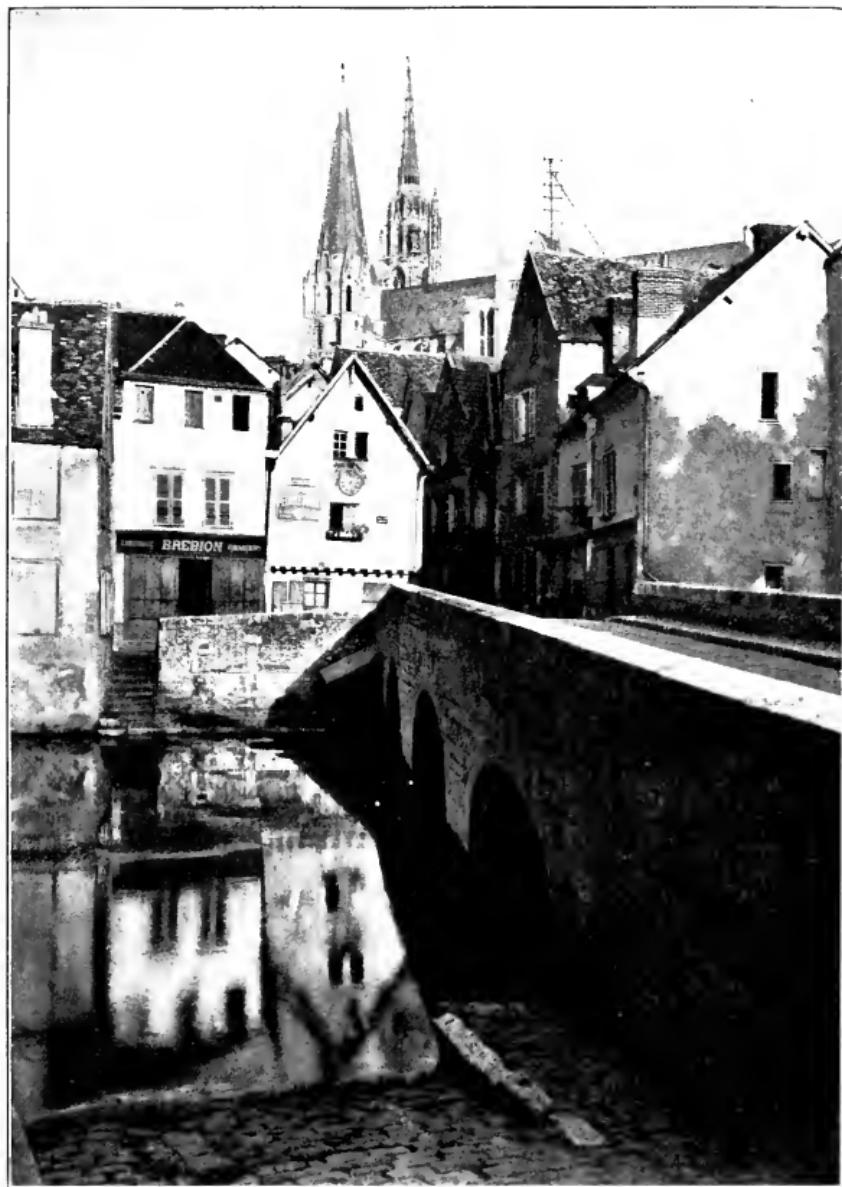
No other developer that has been used for negative making has ever acquired the widespread popularity of pyro, nor has any other developer made negatives which possessed a printing quality which excelled that of a pyro developed negative.

While a pyro developer should always be thrown away after it has been once used it is, nevertheless, the most economical developer known.



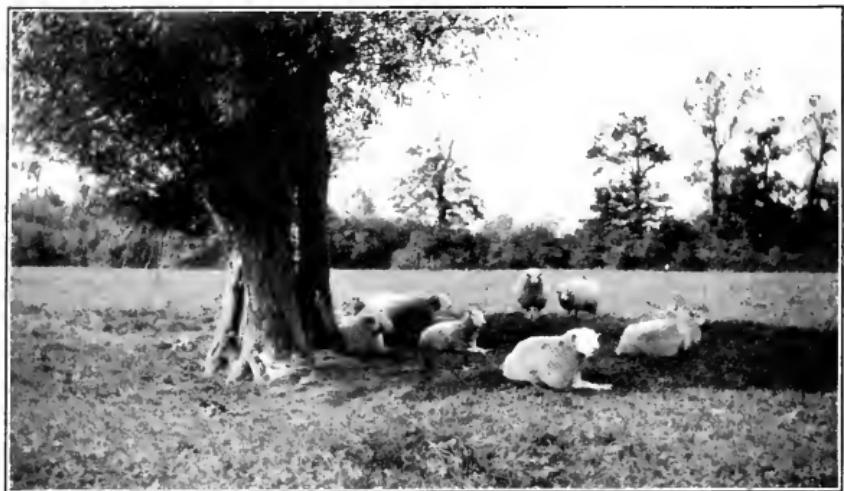
WOODLAND

Made with a 3x4 Folding Kodak



IN OLD CHARTRES, FRANCE

Made with a Premo; stop 16; 1/2 sec.; Wratten K1 Filter



A SHADY PASTURE
Made with a 2C Autographic Kodak Jr.

THE DATE ON THE FILM

WASTE no opportunities. When you make pictures be sure that your film is fresh. If you make a bad print you can throw it away and make another. When you make a bad negative you may have wasted an opportunity that will never come again. Take no unnecessary chances. As a safeguard to photographers, an "expiration date" is put on all Eastman Films, and no film should be put to important use after such date. Because films which have been kept under proper conditions are often good long after the expiration date, some people get careless about this matter of fresh film and sooner or later disappointment follows.

Remember, too, that film will deteriorate between the time of exposure and the time of development

even more rapidly than before exposure, owing to the fact that in the process of passing through the camera it is exposed to air and moisture as well as to the light that comes through the lens at the instant of exposure. In hot, damp climates, especially, it will take up moisture very rapidly and there's then only one safe thing to do—develop promptly. It does no good to wrap it up or put it away in a tin box, for the moisture is now in the film and the box acts like a fireless cooker.

Before development, whether exposed or unexposed, the film should be kept in a cool, dry place.

Always be sure films are fresh when you purchase them, and develop them or have them developed as promptly as possible after exposure.

KODAK SERVICE

As a reader of KODAKERY you are interested in pictures. If you are always making good pictures then the special service we offer to all photographers may not interest you, but, if you have encountered any difficulties in your photographic work, or if you think you should get better results, we wish to help you.

All we need is the negative and the print, with as complete as possible a statement of how they were made—the time of day, the month, the light conditions, the stop used and the exposure given for the negative, and, the name and grade of paper on which the print was made.

What this service means to others is indicated by the following extracts from letters, which are typical of the comments we are constantly receiving from those we have assisted:

"I thank you very much for your letter—and the trouble to which you went in helping me in my photographic problems."

"I feel greatly obliged to you for the pains you have taken to set me right and am most sincerely appreciative of your courtesy and kindness in this matter all the way through."

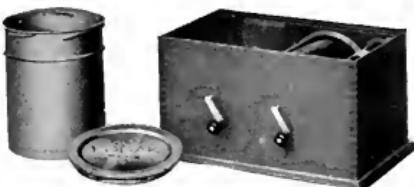
"I have yours of the 23d inst. and I am impressed with your demonstration of 'service'."

"I wish to thank you for the very courteous manner in which you have put your expert knowledge at my service."

All camera users can avail themselves of this service, for which there is no charge, by addressing,

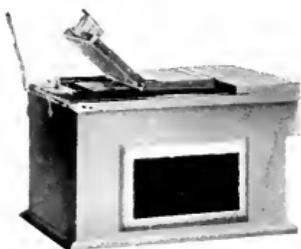
**"KODAKERY," CANADIAN KODAK CO., LIMITED,
TORONTO, CANADA.**

*For developing
the films.*



Price, \$3.00 up

The Kodak Film Tank



*For making the con-
tact prints*

Price, \$7.50

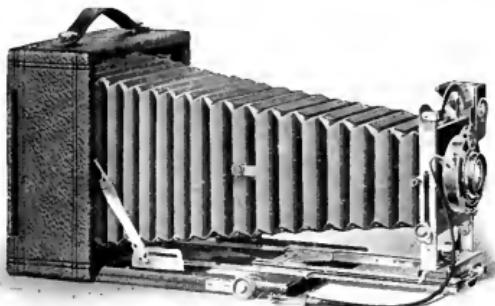
The Kodak Amateur Printer

In combination, these two Kodak helps make
every amateur his own finishing department.

CANADIAN KODAK CO., LIMITED
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At your dealer's.

A Camera for the Naturalist



THE PREMO NO. 9

PROVIDES all of the adjustable features that are so helpful in bird and flower photography. Whatever the conditions may be, you can suitably arrange the size of image, composition and focus.

The Premo No. 9 is furnished in three sizes— 4×5 , $3\frac{1}{4} \times 5\frac{1}{2}$ and 5×7 , varying in price according to the choice of lens equipment.

*Premo Catalogue free at your
dealer's, or by mail*

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

*The presence of this seal on the
chemical container*



means the absence of impurities in the chemical itself. All Eastman Tested Chemicals are identified by this seal of safety.

Here are two of them:

Nepera Solution (a universal developer)

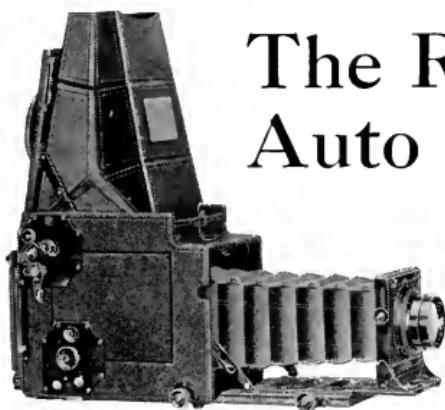
4-oz. bottle	\$0.30
16-oz. bottle90

Kodak Acid Fixing Powder

1/4-lb. package	\$0.10
1/2-lb. package15
1-lb. package25

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You see in full picture size, right side up, every picture you take—as you take it. There is an ease and certainty in getting the required composition and focus with a Graflex that gives added pleasure to picture making.

The effective combination of the Graflex Focal Plane Shutter and high speed lens assures pictures of any subject under any condition when photography is possible.

General view, as well as close-up work essential to the naturalist, are provided for with the bellows capacity of the Revolving Back Auto Graflex.

*Ask for the 64-page Graflex Book
free at your dealer's, or by mail.*

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA



*The date on
the Film*

In just a few years you will ask:

"This picture of John, was it made before or after the war? And this of little Mary taking her first toddling steps—how old was she then?"

"How those snap-shots, made on our trip to Muskoka, bring it all back to us, except the date—when *did* we go?"

Time plays the mischief with memory—but with the *date on the film* you may laugh at his tricks. All folding Kodaks and folding Brownies are now *autographic* and, with autographic film, provide the means for dating and titling each negative as you make it. It is all done in a few seconds, is as simple as "pressing the button" and though it may not seem so at the moment, *a date is always worth while.*

And there is no extra charge for autographic film.

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Kodak catalogue free at your dealer's or by mail



For the picture—*Kodak*
For the negative—*Eastman Film*
For the print—

VELOX

CANADIAN KODAK CO., LIMITED
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With a

Vest Pocket Autographic Kodak

you will get pictures that you never would get with a larger camera, because the larger camera would be home. It's always convenient to take along a V.P.K. There is a place for it in every amateur's photographic equipment.

Price, \$9.00



Vest Pocket Kodak, Actual Size

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KODAKERY

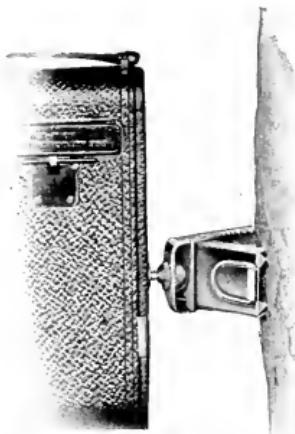
A
MAGAZINE *for* AMATEUR
PHOTOGRAPHERS



SEPTEMBER 1919

**CANADIAN KODAK CO., LIMITED,
TORONTO, CANADA,**

INSTEAD OF A TRIPOD



Kodapod

Price, \$2.00

This little device, which may be carried in the vest pocket, renders full tripod service for outdoor work whenever a tree, fence or similar object is at hand.

Its jaws grip the wood, and its teeth bite the bark so tightly that rigid camera support is assured.



Optipod

Price, \$1.00

Clamped to chair, table, automobile, etc., it holds the Kodak rigid during exposure.

Used in connection with a tripod, however, the Optipod gives the added advantage of its ball and socket joint and permits the camera to be tilted to any desired angle.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's.



If it isn't an Eastman
It isn't a Kodak



THE SPIRIT OF SUMMER

Made with 3A Kodak; $\frac{1}{2}$ sec. exposure; stop, f.8

KODAKERY

A Journal for Amateur Photographers

PUBLISHED MONTHLY—YEARLY SUBSCRIPTION, 50 CENTS; SINGLE COPIES, 5 CENTS.

VOL. VI

SEPTEMBER 1919

No. 11



THE RAIDED NEST

THE MYSTERY OF THE ROBIN EGGS

BY HOWARD TAYLOR MIDDLETON

Illustrated by the Author

A GREAT turmoil was in progress in wild-life land. The home of the Robin Red-breasts had been desecrated, three wonderful blue eggs destroyed, and the owners were frantic with rage and sorrow.

We arrived upon the scene in

time to catch a fleeting glimpse of the criminal as he fled away through the foliage, but could get no clue as to his identity.

Desiring a picture of the ravished abode, we set up our Kodak, making an exposure of $\frac{1}{2}$ second, stop 16. Having written the first



THE YOUNG BLUEJAYS

chapter in our photographic detective story, we set out to acquire the material for the next.

"Jay! Jay! Jay!" came to our ears in strident tones from a group of seedling firs across the woodland, and, journeying in that direction, we came upon two young bluejays calling loudly for their dinner. This bird has a very unsavory reputation among his feathered brethren, and among the many crimes

laid at his door is that of nest robbing. Therefore, we suspected the parents of these youngsters of being the guilty ones.

As the branch upon which the young birds perched was in bright sunlight, we snapped them at a speed of 1-50 second, using the largest stop.

Now that the material for our second chapter was procured, we decided to lie in wait for awhile in



THE CROWS' CHORUS

the hope of getting a photograph of the old jays, thus completing the tale, but although we remained for quite an hour, we did not see them.

Upon our homeward way, at the edge of the woodland, a family of crows was discovered in the very act of breaking home ties, and they greeted us with a hoarse chorus, "Caw! Caw! Caw!" The young crows were out of the nest and receiving their first instructions in the art of aviation. It was work requiring much patience and agility

upon the part of the photographers to induce them to assemble in a group long enough to have their portraits taken. This feat was finally accomplished, however, and the photograph was secured by giving an exposure of 1-50 of a second, with the largest stop, in subdued sunlight.

Corvus, the crow, is also exceedingly fond of eggs, so our detective story remains unfinished. Whether it was Jim Crow or Sammy Jay who broke the robins' eggs is still a mystery.

PORTRAITS IN THE HOME

THE impromptu portraits that are made in the home, with the home furnishings for a background, are pictures that every family wants, and when they portray the members of the family in their characteristic attitudes or engaged in their home occupations and pastimes they have a value which money cannot measure.

Such portraits can be made with any kind of a hand camera, in any room that has a window which receives the unobstructed light from the sky, and one of the ways to make them—a way which always insures a pleasing lighting—is the method by which the photographs, reproduced on pages 7 and 9, were obtained.

These were made in an ordinary room, with the subject and the camera placed in the positions indicated in the diagram. The subject was about two feet from the wall and four feet from the window. All curtains and window shades were removed and then a shade was placed over the lower half of the window for shutting out the horizontal side light, so that the light which came through the upper half would reach the subject at a downward angle of about 45 degrees.

Light coming downward at an angle of 45 degrees places more tones of light and shade on the face than light coming directly from the side, and it should always be used when the conditions will permit.

In order to secure the kind of lighting we are describing the subject must never be placed directly opposite the window. It is necessary that the position selected

should be a short distance diagonally back of the window (a short distance to our right or left when we stand in front of the window, facing it) so that the light will reach a part of the shadow side of the face, that is, the side which is farthest from the window. This guards against too great a contrast in the lighting of the two sides of the face, and furthermore, the position we have indicated is the best one in which to place such active subjects as young children, for unless they turn the head so that no direct light reaches the face, a picture can most certainly be obtained in which the lighting of the face is pleasing.

The camera must be placed on a tripod or some other rigid support, because indoor portraits cannot, ordinarily, be made with snapshot exposures. By a snapshot we mean any exposure which is as fast as 1-25 of a second. There are, of course, exceptions to this statement, but they only apply to rooms that are finished in white, or some color that photographs very light, which receive a flood of strong light directly from the sky, and to such places as conservatories which have glass walls and roof.

While the light conditions are seldom favorable for making 1-25 second snapshots indoors, there are many homes which have rooms in which the light, close to the windows, is bright enough, near the noon hour on sunny days, for making portraits with a 1-5 second exposure when an *f*.6.3 lens is used with its largest stop.



Made With a Special Kodak
*Room with light colored walls and ceiling. Exposure, 1-5 sec.;
stop f.6.3; bright sunshine outdoors*

The way to secure the strongest light indoors is to lower the top half of the window and remove the screen, if one is present. This can be done without discomfort during the summer months.

Our illustrations are typical examples of many indoor portraits we have seen that were made with the Special Kodaks and Premos with 1-5 second exposures without the window being open. These pictures were made at about 11 o'clock, when the sunlight was very strong, near a north window that received the direct light from the sky. There was no porch roof, no tree or any nearby building to shut

out any light. The room had a white ceiling and very light cream-colored walls.

When rectilinear or single lenses are used for making indoor portraits it will be best to give an exposure of 1 or 2 seconds with the largest stop. Splendid results can be obtained with these slower lenses, as nearly all children over five can remain perfectly quiet for one or two seconds, and younger children will do so if they are interested in something which engages their attention.

Our illustrations were made without the use of a reflector, because there was a window near the

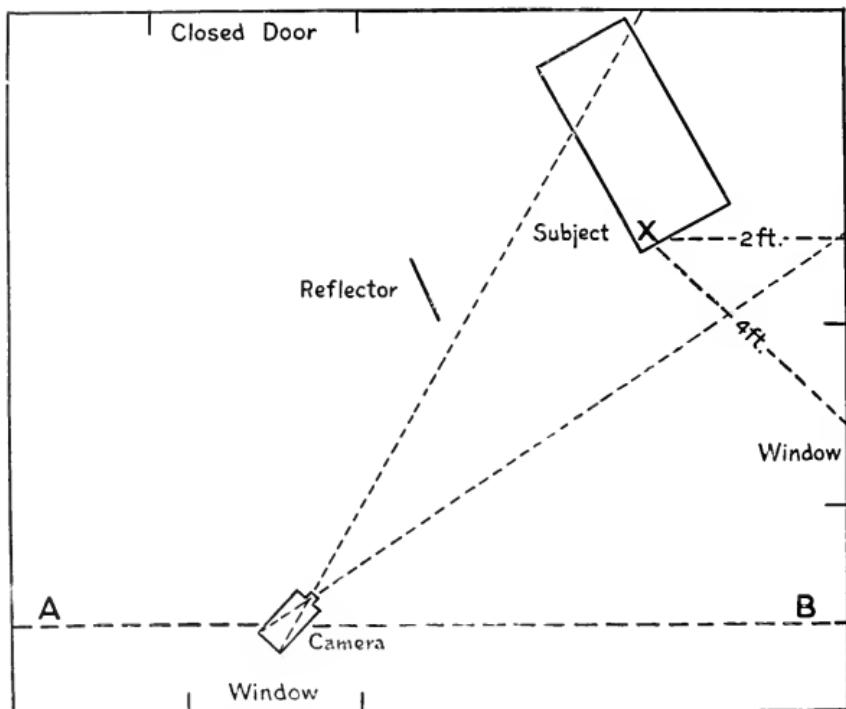


Diagram of 10 x 12 room, with two windows, in which pictures on pages 7 and 9 were made. Note that reflector is outside full view of lens, as indicated by dotted lines leading from camera.



MADE WITH 3A SPECIAL, KODAK
Conditions the same as in picture on page 7. Variation of trimming of print is suggested by changed center of interest.

camera (see diagram) which allowed enough light to reach the shadow side of the subject. When no window that will do this is available it will be best to use a reflector for lighting the shadow side of the face.

Any white cloth or paper, supported on two sticks shaped like the letter T will serve as a reflector. The upright stick may be tied to a piece of furniture so placed that it will be from three to six feet from the subject, in the position shown in the diagram, but it must always be so placed that it cannot be seen in the finder, or it will show in the picture.

The first requirement in portrait work is a good lighting. When this has been secured by the method we have described good results can be obtained by placing the camera at any point along the line A—B in diagram. The point along this line from which to make the picture is

the one from which the most pleasing view can be seen.

It is a wise precaution to shade the lens by standing a little in front and well to one side of the camera (between the lens and the window) so that the direct light from the window cannot shine on the lens. The only light that is used for making the picture is that which is reflected directly from the subject to the film. All light that enters the lens from any source that is outside the area that is being photographed only tends to degrade the brilliancy of the picture. This is especially noticeable when a strong light shines obliquely on the lens.

Father in his easy chair, mother sewing, sister reading, the youngsters with their toys, all are splendid subjects for the kinds of pictures that can be made nowhere but in the home, and such pictures can easily be obtained by the method we have described.



IN FLEET FORMATION
Made with a Premo



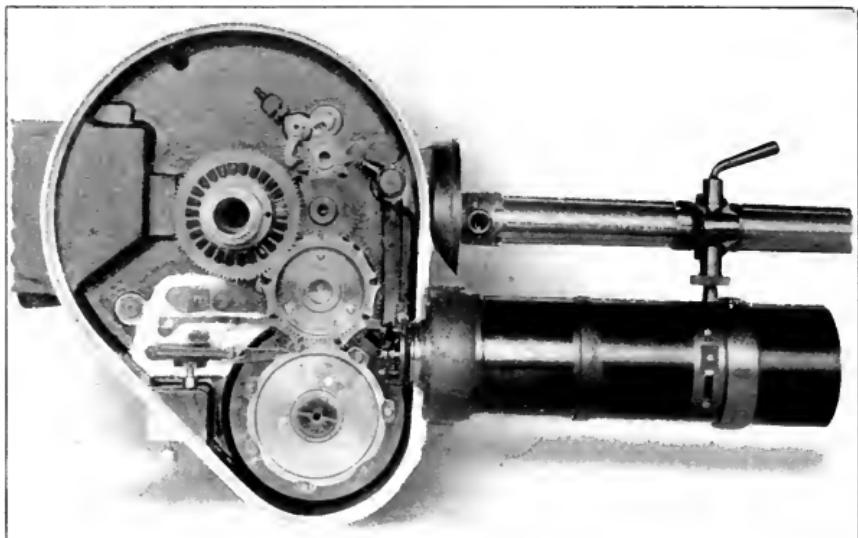
A RESULT OF MARKSMANSHIP—GERMAN PLANE BROUGHT DOWN WITHIN THE BRITISH LINES

From British Official Photograph

TEACHING AVIATORS TO SHOOT BY PHOTOGRAPHY

How is it possible to tell whether one aviator scores a hit on another when the fighting is make-believe, as at training fields? It is needless to say that real bullets are out of the question, and towing a target, as they do in the navy, is extremely hazardous. Yet accurate and speedy shooting is, next to expert flying, the essential of all essentials in a war aviator's repertoire. The answer to the question is wrapped up in another one of those interesting phases of mechanical and inventive genius that

so helped to place the Allies on top, particularly after America jumped into the fray. Photography was brought into play by means of a special camera which can take the place of a Lewis machine gun of the cartridge magazine with operating conditions exactly the same as in shooting real bullets. This gun camera was designed by the Camera Works of the Eastman Kodak Company, and a picture is made for every bullet that would have been fired, showing the exact position of the opponent's aeroplane at the time of firing and



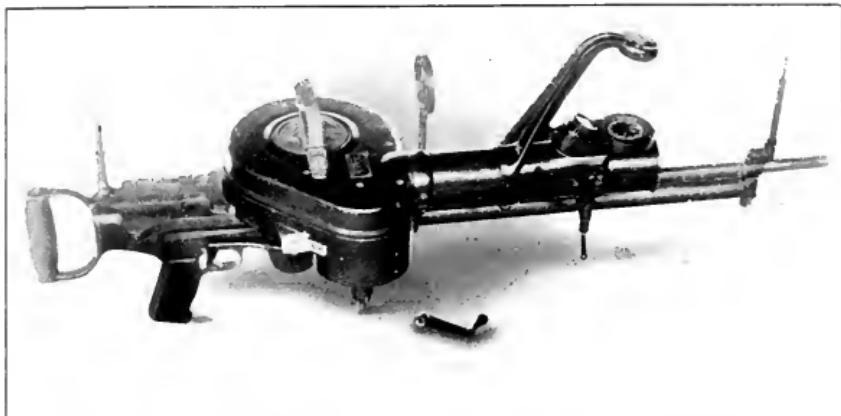
MECHANISM THAT OPERATES THE GUN CAMERA

thus determining whether the plane would have been hit in a vital area or not. Not only this, but the time of making each shot is photographed, so there can be no dispute as to which aviator gets in the first lucky burst of shots.

At the time of the entrance of the United States into the war British aviators were using a gun camera, patterned after a Lewis machine gun, with a long lens barrel substituted for the shooting barrel of the machine gun. This camera was designed to make twelve exposures at one loading and for each exposure a manual operation was required. In other words, the aviator could only make one shot at a time and twelve shots before he would have to reload. With the true co-operative spirit that was evinced by all the Allies, and especially Great

Britain, in giving us the benefits of their previous experiences in the war, the British authorities turned this gun camera over to our army men who in turn gave the Eastman Kodak Company orders to make duplicates of it.

One of the Kodak Managers at once questioned the need of a heavy separate gun camera with its big lens barrel. Why not have a special camera attachment that could be fastened to the same gun that the aviator is continually using? The engineering department of the Eastman Kodak Company was given the job of answering the question—and they did it as the accompanying illustrations will prove. Not only did they build a camera that could be attached directly to the gun, in place of the ordinary ammunition magazine,



GUN CAMERA MOUNTED ON LEWIS MACHINE GUN, SHOWING
TIMING DEVICE

but they produced a camera that could make 100 exposures on one loading, that is, a number equivalent to 100 rounds of ammunition and, like the machine gun itself, fire in "bursts," that is, continue firing automatically as long as the trigger is under pressure.

The Gun Camera, Mark 1, as it is officially called, weighs thirteen pounds all told, and has a lens barrel only eight inches long and two and one-half inches in diameter. It is of metal construction throughout. The magazine of the camera, in which is placed a strip of film, instead of being circular, as is the cartridge magazine of the machine gun, is oval-shaped; it is fitted with a Lewis gun magazine lock which completely fastens the magazine to the gun camera.

Soon after the gun camera was put into use arguments developed as to which aviator first "shot" the other where both showed "hits" on their film. A timing de-

vice which would record the time of each exposure was then demanded and for a while this demand seemed to present an insurmountable obstacle, for of course, every one thought the timing would have to be done mechanically, and what that would mean in gears and mechanisms can only be left to the imagination. Finally, one of the Kodak Research engineers suggested that the timing be done optically, and as a result of this suggestion one of the most unique developments of the war was brought about. Moreover, what seemed so difficult was really solved in an amazingly simple manner. Use is made of a system of mirrors, one attached to an arm fastened to the lens barrel and the other inside the lens barrel, which reflect an image of the face of a watch, attached to the lens barrel, on to the same part of the film on which the opposing aeroplane is

photographed. Thus the time, in split seconds, is shown on the film for each exposure.

Each gun camera is ordinarily provided with three magazines which may be loaded in daylight. If an embryo fighting aviator, therefore, takes up with him these three magazines loaded to capacity, he can "shoot" 300 times. The film in the magazine is ordinary motion-picture film which travels from a spool in the small end of the magazine past a light trap, where it is exposed, to a reel five inches in diameter at the larger end of the magazine. The magazine is 10 $\frac{1}{4}$ inches long and 8 inches wide at the larger end.

Now, in the Lewis machine gun after a bullet has been fired, the gases resulting from the recoil eject the empty cartridge and automatically replace a loaded cartridge, so in order to continue firing all one needs to do is to continue pressure on the trigger. With the gun camera something must be substituted for the recoil caused by the cartridge charge, and so use is made of a spring which is wound up with a handle similar to that employed in winding up talking-machine motors. The spring is fastened directly to the shaft that turns the 5-inch reel, and through a mechanism, called a Geneva movement, which causes an intermittent action, to the shutter mechanism in the lens barrel. Thus, as the film is moved steadily past the light trap, the shutter opens and closes for making the various exposures to show the location of the opposing aeroplane, each opening occurring at the time a machine-gun bullet would have been fired.



Photograph shows that the "shot" was fired at 43 minutes, 27 3-5 seconds past 10 o'clock

To facilitate spotting the shot from the gun camera, a glass plate, called a graticule, is placed in the barrel at the focal plane in contact with the film. This plate is marked with a vertical and horizontal line passing through the centre and one small circle, which one might say indicates the bull's-eye, and two large circles drawn close together describing the outer field covered by the camera. These circles and bisecting lines are recorded on the film at each exposure and the position of the opponent aeroplane is indicated by means of them.

Of course, one must realize that in aerial fights machines are going at tremendous speeds and the position of the opposing machine at the time of firing a bullet (making exposure) is not quite the same as at the time the bullet reaches the machine. One can tell, however, fairly well by the direction the opposing aeroplane was going, as shown on the film, whether it would have been hit in a vital spot or not. Thus, if the machine is pointed toward the centre or

bisection of the lines and is very close to the bisection, the chances of its having been hit would have been very good. If the machine has been shown in the same position with regard to the center point, but going away from it, the margin of speed would probably just about have saved it from being hit. In a straight pursuit a hit is indicated when some vital part of the machine covers up the centre of the field. How the opposing aeroplane is shown in flight, in relation to the lines of the graticule in the gun camera, is indicated in the illustration on page 14 which is a reproduction of a strip of film exposed in the gun camera from another aeroplane.

The gun camera is registered properly in relation to the sights of

the machine gun to which it is attached by first sighting the machine-gun sight on some definite point a certain distance away and then moving the camera so the point of the bisecting lines of the graticule fall exactly on the point on which the gun was sighted.

The advantages of a device, such as the camera attachment described above for Lewis machine guns, which gives fighting aviators necessary target practice under combat conditions, are self-evident. The story of the development of the gun camera is one of the romances of the war. It provides additional proof that the initiative and untrammeled thinking begotten of democracy can outdo the heavy thought of autocracy in any real test.



A LONG-DISTANCE BOMBER LED INTO POSITION BY TRACTOR
British Official Photograph

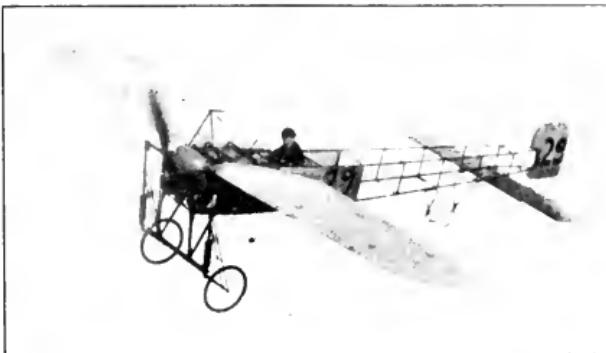
S U M M E R



PLAY

□

KODAK NOTES OF SPORT DAYS AND WAYS





Invisible Limit of Violet Blue Blue-Green Yellow-Orange Red Deep Limit of
Ultra-Violet Visibility Green Green Red Visibility

FIG. 1

THE FUNDAMENTALS OF PHOTOGRAPHY

BY DR. C. E. K. MEES

CHAPTER XVI—ORTHOCHROMATIC PHOTOGRAPHY

In the last chapter we saw that by passing a beam of white light through a prism it is split up into a band of color which is called the *spectrum*, the splitting being due to the fact that the light waves are of different lengths, corresponding to the different colors, and that these waves are bent differently by a prism according to their length, the shortest waves, which are blue and violet in color, being bent most, and those which are red in color being bent least.

If we look at this band of colored light we shall see that the brightest part of it is the yellow-green and yellow (the position of the yellow in the spectrum being between the yellow-green and the orange) so that the eye is most sensitive to the

yellow, yellow-green and red rays and least sensitive to the blue and violet rays. (Fig. 1.) But if, instead of looking at the spectrum, we use a piece of bromide paper so that the light of the spectrum may fall on it, and then make a positive print from this negative image, we shall find that the photographic action on the print is not produced in the region that is bright to the eye but in the region which the eye can scarcely see, and, indeed, there is a strong action in the part of the spectrum beyond the visible spectrum, showing that there are waves which are shorter than the violet waves, which were discovered when the spectrum was first photographed and are called the *ultra-violet* waves. (Fig. 2.) This explains



Invisible Limit of Violet Blue Blue-Green Yellow-Orange Red Deep Limit of
Ultra-Violet Visibility Green Green Red Visibility

FIG. 2

at once why when we photographed an orange on a blue cloth the orange was dark in the photograph and the blue cloth was bright, which is the opposite to the way they appear to the eye. The bright orange absorbs the blue light to which the film is sensitive and the blue cloth reflects it, so that although the cloth looks dark to the eye, it is bright in the photograph,

chromatic film is a great advantage.

The orthochromatic film is still not sensitive to red, which to the eye is a bright color, and so red objects are still too dark when in a photograph, but this is not a great disadvantage for most work, and it gives us the very great advantage that the film can be developed in a red light.

It is possible to treat a film with

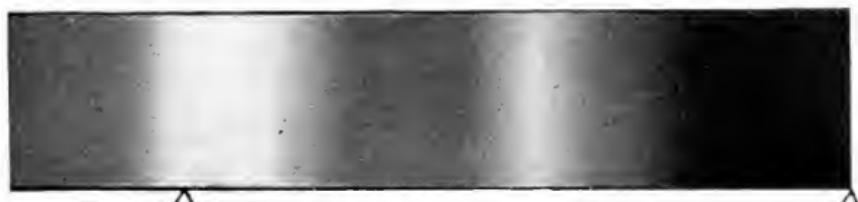


FIG. 3

and the orange which reflects very little blue and violet light is dark in the photograph. Fortunately, this defect, for defect it is, of photographic materials can be remedied to a considerable extent.

If dyes are incorporated with the emulsion the dyes sensitize the emulsion for the part of the spectrum which they absorb, so that if we put a pink dye of the right kind in the emulsion the film will not only be sensitive to the blue light, to which it is naturally sensitive, but will also become sensitive to the yellow-green light, which the pink dye absorbs, and if we take a photograph of the spectrum on this sensitized film we shall get a photograph which appears as is shown in Fig. 3. Film made sensitive in this way is called *orthochromatic*, and in photographing colored objects the use of an ortho-

dyes which makes it *panchromatic*, that is, sensitive to all colors, but a panchromatic film would have to be made and developed in total darkness, and that is so difficult that it is better to be content for most work with the orthochromatic film, which, when properly handled, enables a good rendering of colored objects to be obtained and at the same time is easy to use.

Great care is taken to make Eastman NC films as orthochromatic as will confer satisfactory color sensitiveness upon it without sensitizing it so far that it will be difficult for the user to handle or that there will be danger of fog when developing it.

While the sensitizing with dye makes the film sensitive to the yellow and green light, it is still much more sensitive to the blue and violet waves, as is shown in Fig. 3,



FIG. 4

and consequently it will still photograph blue objects as much lighter than they appear to the eye. This is a disadvantage in some photography, and especially in landscape photography, where we have blue sky with white clouds. White clouds are much brighter to the eye than the blue sky, but if they are photographed on the film in the ordinary way the blue sky appears too light and the clouds are lost against it. In order to overcome this and to enable orthochromatic film to represent most of

the colors in their correct tone values light filters are used which absorb the excess of blue light and prevent it from reaching the film.

These light filters are, of course, yellow in color, since yellow absorbs blue light and thus, by the use of yellow light filters, which are sometimes called color screens, the excess of blue light can be absorbed and a much improved rendering of sky and clouds can be obtained. (Fig. 4.)



WHEN LIGHT TONES PREDOMINATE

WHEN making pictures, in bright sunshine, of extremely distant landscapes, boats that are 200 feet or farther away on broad expanses of water, and sandy beaches, with no trees or shrubbery or other dark colored objects in the foreground, give only half the exposure that is needed for

ordinary landscapes in which there are prominent foreground objects. A 1-25 second exposure, with stop 32 (*f*.22) is ample.

With fixed focus, single lens cameras make a snapshot with the next smaller stop than the one you use for ordinary snapshot work.



ON THE SANDS

Made with a No. 3 Folding Pocket Kodak

IN HOT WEATHER

SHOULD some of the negatives that are made during the summer months have more density and consequently print more slowly than those made in winter, or should it sometimes prove difficult to make as good prints in summer as in winter, the cause may be found in the temperature of the developer.

Those of us who live in cold climates heat our houses in winter, and we try to keep the temperature of our living rooms at about 70 degrees, Fahrenheit, but in summer, when we depend on the heat that comes from the sun, the temperature in our rooms often rises above 80.

The sun also warms the water we use for mixing the developer so that the temperature of the developer is higher during the hot summer than during the cold winter months.

The length of time that films should be developed in the tank depends on the temperature of the developer, which can only be determined by testing it with an accurate thermometer. When films are developed in the tank, *not in the tray*, correctly developed negatives can be obtained, at all times of year, with the developer at any temperature between 45 and 70 degrees, by developing them for



IN OLD CHARTRES, FRANCE

Made with a Premo Camera. Exposure 1:5 second; stop 16; Kt Filter

the length of time the tank instructions recommend—20 minutes if the temperature is 65 degrees, or 1 minute less than 20 for each degree over 65, or 1 minute more than 20 for each degree under 65, when one tank powder is used.

Because prints are developed in the tray and development is stopped when the prints look right, some workers pay little attention to the temperature of the developer that is used for photographic papers, with the result that during the hot summer months the developer is often too warm, and the quality of the prints suffers in consequence.

It might seem that shortening the time of development when the developer is warm, and increasing the time when the developer is cold,

should have the same effect on a print that it has on a negative, but such is not the case. The emulsions are different, and the images differ, in that the negative image is not a surface image; it is embedded in the film and can only be seen by the light that passes through it, while the image in a print must be on its surface so it can be seen by the light that is reflected from it.

In order to obtain a print that records the various tones that can be seen in the negative it must be exposed to the printing light for the length of time needed for the light to pass through the negative image and affect the silver in the printing paper, and it must then be developed, in a developer that is of the right temperature for blackening the silver on which the light has



DOMESTIC SERVICE
Made with a Kodak

acted, *within a specified time*. Unless this is done the print will not rightly record the various tones that the negative shows.

The length of time that a print should be developed, and the temperature at which the developer should be used, are stated in the instructions that are furnished with all development papers, and while the time and the temperature can be varied *slightly*, without detriment to the print, the permissible variations, with all papers, are small.

The full scale of tones that Contrast and Regular Velox render cannot be developed in less than 15 or 20 seconds, and Special

Velox, which prints faster but develops slower, cannot render its full scale in less than about 30 seconds, when the Velox developer is at a temperature of about 70 degrees.

Too warm a developer always develops prints so rapidly that they cannot rightly record the tones that are in the negative, and too warm a developer is very apt to stain the prints.

When the developer is warmer than 70 degrees it should be cooled. This can be done by placing the developing tray in a larger tray containing ice water. Another convenient method, which the writer often employs when the tap water



THE MAN WITH THE PLOW
Made with a No. 2 Folding Pocket Kodak



STUNTS WITH THE LARIAT
Made with a Kodak

runs at about 70 degrees, is to keep a stream of water flowing through a rubber tube into the larger tray while the developing tray floats on the surface of this running water.

Since the top of the floating tray has always been well above the surface of the water no difficulty has ever been encountered with either of these methods, but should it happen that water from the large tray gets in the developer while the small tray is being rocked during the development of the print, the difficulty can be overcome by placing a couple of long iron spikes, or any narrow strips of metal, under the developing tray so that fully half the height of the tray will be above the surface of the water.

Equally important is the temperature of the fixing bath. This should be at about 50 to 55 degrees F. When warmer than 55 degrees it can be cooled by moving a chunk of ice around in it for a few minutes just before the bath is to be used, the ice to be removed, of course, before prints are placed in the bath. This will keep 64 ounces of bath sufficiently cool for about an hour, unless the temperature of the room is over 85 degrees. If a smaller quantity of bath is used it can be kept cool by placing the fixing tray in a larger tray containing ice.

When ice is not obtainable it is best to make up the needed quantity of a fresh acid fixing bath for each batch of prints immediately before, not a long time before, it is to be used. The reason for mixing it just before use is that hypo cools the water in which it is dissolving, but after it has dissolved the tem-



HOMEWARD BOUND
Made with a Vest Pocket Kodak

perature of the bath gradually rises until it has become as warm as the air in the room.

The influence which temperature has on development and fixing is so great that it should never be ignored. Those who do ignore it, and those who try to determine the temperature of a solution by placing the finger in it (a very unreliable method), take the risk of encountering wholly needless complications, and it is for the sake of protecting the photographer against these complications that the accurate Eastman Thermometer and the Stirring Rod Thermometer are furnished by Kodak dealers. These thermometers are of the special designs which have proven most convenient for the photographer's use.

KODAK SERVICE

As a reader of KODAKERY you are interested in pictures. If you are always making good pictures then the special service we offer to all photographers may not interest you, but, if you have encountered any difficulties in your photographic work, or if you think you should get better results, we wish to help you.

All we need is the negative and the print, with as complete as possible a statement of how they were made—the time of day, the month, the light conditions, the stop used and the exposure given for the negative, and, the name and grade of paper on which the print was made.

What this service means to others is indicated by the following extracts from letters, which are typical of the comments we are constantly receiving from those we have assisted:

"I thank you very much for your letter—and the trouble to which you went in helping me in my photographic problems."

"I feel greatly obliged to you for the pains you have taken to set me right and am most sincerely appreciative of your courtesy and kindness in the matter all the way through."

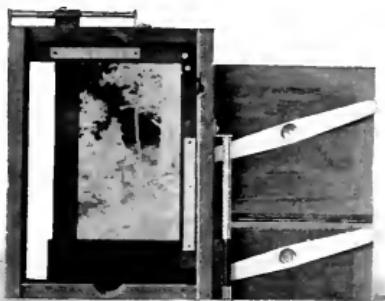
"I have yours of the 23d inst. and I am impressed with your demonstration of 'service'."

"I wish to thank you for the very courteous manner in which you have put your expert knowledge at my service."

All camera users can avail themselves of this service, for which there is no charge, by addressing,

**"KODAKERY," CANADIAN KODAK CO., LIMITED,
TORONTO, CANADA.**

KODAK AUTO MASK PRINTING FRAME



A metal mask that may be adjusted to fit any of the regular amateur size negatives is one feature.

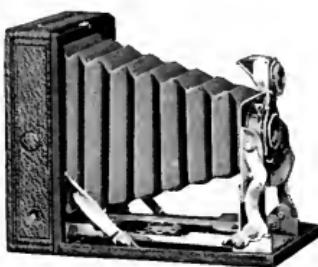
The fact that mask, negative and paper are kept in perfect contact, whether for one print or a hundred, is another.

There is no better printing frame than the Kodak Auto-Mask.

Price, \$1.25

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's.



The POCKET PREMO

\$10.75

A wealth of convenience and quality in small dimensions

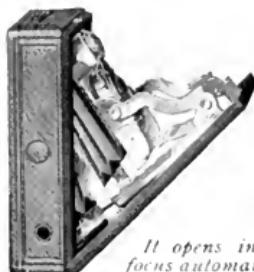
THIS little camera makes $2\frac{1}{4}$ x $3\frac{1}{4}$ pictures, yet is only an inch and a quarter in thickness, three and a quarter inches wide and a shade over four and a half inches long.

With all working parts fully enclosed when it is shut, it still opens to focus automatically when the front board is dropped. It loads in daylight with Premo Film Packs—just insert the pack, pull out a paper tab and you're ready—the simplest of all loading devices.

Has a meniscus achromatic lens, Kodak Ball Bearing Shutter, reversible finder and tripod sockets for either vertical or horizontal exposures.

Covered with a fine quality of grain leather and is genuinely good all the way through.

At any Kodak Dealer's



It opens into focus automatically when the front board is dropped.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA



No one can develop negatives by *any* method better than *you* can with a

KODAK FILM TANK

The outfit is self-contained, there is room for it in your suit case.

Price from **\$3.00** up

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's.

GRAFLEX

The camera that does the difficult things in photography—and does them well.

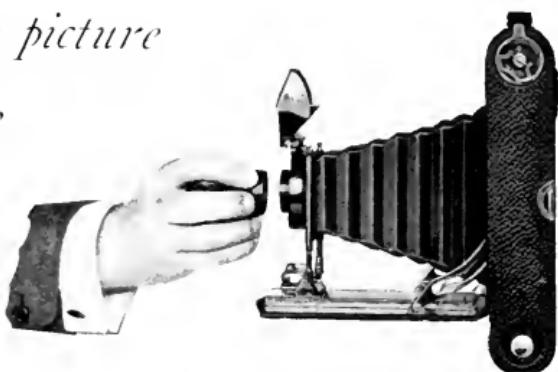
The automobile racers are going by your point of vantage at a hundred miles an hour; a quick snap of the ball from the pitcher's box to "first" has caught the runner napping; the children are romping at play on the half shaded porch—impossible pictures for most cameras, but simple with a Graflex.



The Graflex catalogue—free at your dealer's or by mail—tells you why.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

*For the picture
close-up,
put a*



Kodak Portrait Attachment

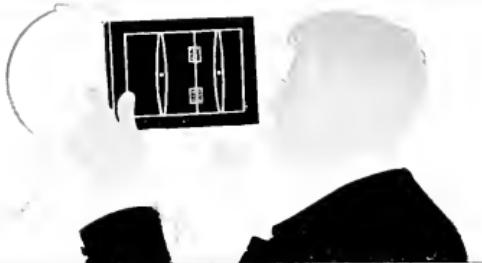
over the regular lens equipment.

Through this means your camera is brought into sharp focus at close range and the result is a correspondingly large image.

Price, 50c.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's.

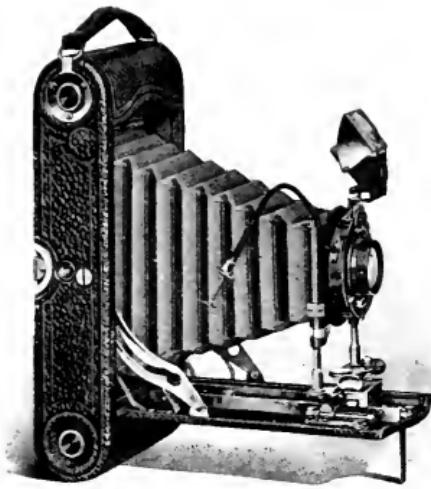


VELOX

Makes a good print from a fair negative, an excellent print from a good negative and the best print possible from any negative.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's.



For pictures 'round the world or 'round the house—for the story of the tour or the history of the household—

3A Autographic Kodak

Post Card Size Pictures

Price, \$25..25

**CANADIAN KODAK CO., LIMITED
TORONTO, CANADA**

At your dealer's.

KODAKERY

A
MAGAZINE *for* AMATEUR
PHOTOGRAPHERS



OCTOBER 1919

CANADIAN KODAK CO., LIMITED,
TORONTO, CANADA.



Keep a Kodak Story of the Children

SUCH pictures, preserving forever the childhood days, mean a world of comfort to mother's heart—yes, and to father's too.

And just a few years afterward: "That's you, Polly, when you were—let me see. Oh yes, the film says it was August eight, nineteen nineteen, your fourth birthday. And Junior was five."

Every picture worth taking is worth at least a date, if not a title. It's all very simple with an AUTOGRAPHIC KODAK, as simple as pressing the button. And Autographic film costs no more than the other kind.

CANADIAN KODAK CO., LIMITED
TORONTO, CANADA

At your dealer's.



If it isn't an Eastman
It isn't a Kodak



IN THE SUNLIGHT OF SOUTHERN FRANCE

Made with a 3A Kodak; stop, 16; exposure, $\frac{1}{2}$ sec.



PUBLISHED MONTHLY—YEARLY SUBSCRIPTION, 50 CENTS; SINGLE COPIES, 5 CENTS.

VOL. VI

OCTOBER, 1919

No. 12



THE LESSON WITH THE NEEDLES

Made with a Premo

GENRE PICTURES

MANY hundreds of outdoor portraits have been among the negatives and prints that our readers have sent us for criticism. These came from all over the country.

Greatly as these portraits necessarily differed from each other, most of them were, in one respect, strikingly alike, for they represented

the subjects consciously posing and looking at the camera.

We do not wish to criticise this, because it is a perfectly natural thing for people to do when they are being photographed, as is evidenced by pictures that are made of the people of all races and nationalities in all parts of the world, and it is as impossible as it is un-



FOUR-FOOTED FRIENDS
Made with a Premo

desirable always to eliminate the evidence of conscious posing from pictures that are not intended to be anything else than formal portraits.

But those who confine their efforts in portraiture solely to the securing of good likenesses are neglecting splendid opportunities for making genre pictures, that is, pictures that realistically depict scenes from everyday life, and, since it is the everyday life of our friends that make them what they are to us, the pictures that remind us of this will prove valuable as supplements to the formal portraits.

It is the things that people are in the habit of doing that make up their everyday life, and anyone who is engaged in any occupation or pastime that is a part of the day's routine presents a subject for a genre picture.

Since such pictures are not portraits, the making of them, out of

doors, is as simple a matter as photographing a landscape. It is usually snapshot work which can be done with any kind of a hand camera, and the only difference between landscape work and genre work that the photographer needs to consider is, that a landscape never poses for the camera while the subject of a genre picture sometimes does.

This posing, which is due to the consciousness of being photographed, is the chief difficulty the photographer has to contend with. If the subject's attention is centered on the camera or on the photographer, instead of on the occupation or pastime that furnishes the motive for the picture, the result may be a pleasing portrait, but it will not be a genre picture.

The way to eliminate this handicap is to persuade the subject to keep right on working or playing,



WAYSID TREASURES

Made with a Kodak

and to avoid looking at either the camera or the photographer, after all is in readiness for making the exposure. Most people can do this

if they are not disturbed with suggestions or comments and are not allowed to know when the exposure will be made.



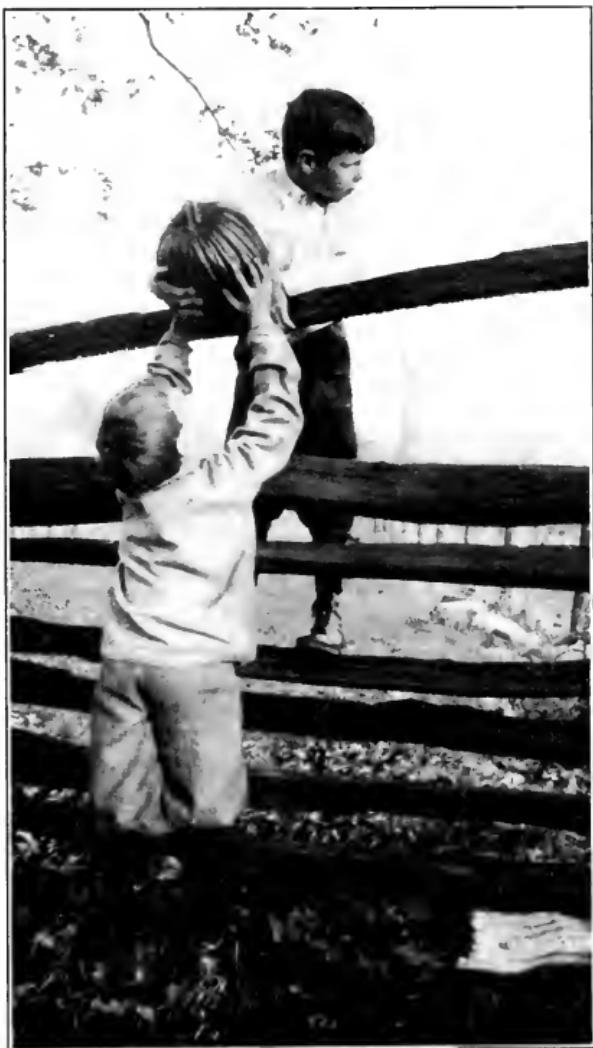
THE CATCH—*Made with a Kodak*

Genre pictures can be made wherever men or women or children happen to be engaged in any accustomed pursuit, or in doing anything that is characteristic of their age or station in life. The carpenter erecting a building, the mason mixing mortar, the flagman stopping traffic at the railroad-crossing, the street cleaner wielding his broom, the gardener at work among his flowers, the children playing in the sand pile, and all the many varied occupations of the members of the family about the home, in the hours of work or play or rest, suggest but a few of the limitless possibilities of this kind of work.

Photographers who once enter this field seldom abandon it. They



THE SHOP DOOR—*Made with a Kodak*



AN ADVENTURE
Made with zC Cartridge Premo

quickly discover that it furnishes an inexhaustible supply of picture-making material.

Such pictures tell a real story of life—the most interesting thing in the world.

Our illustrations represent simple, everyday pictures of the type we have described. Simple as these pictures are, they are of general, rather than of merely local interest, because they possess a characteristic which pictures that are of

purely local interest never have—they appeal to many who are not acquainted with the subjects or the scenes portrayed, and the reason why they do this is that they tell a story which contains human interest—the story of the everyday life of the actors in the scenes. These are not portraits, they are genre pictures, and they are the kind of pictures that, when enlarged and framed, compel those who glance at them to pause and read their story.



ROCK AND SPRAY

Made with 3A Folding Kodak. Exposure, 1-25 sec.; stop, f. 22

AVIATION CAMERAS

ONE OF THE IMPORTANT PHASES OF THE KODAK COMPANIES' WAR-TIME ACCOMPLISHMENTS

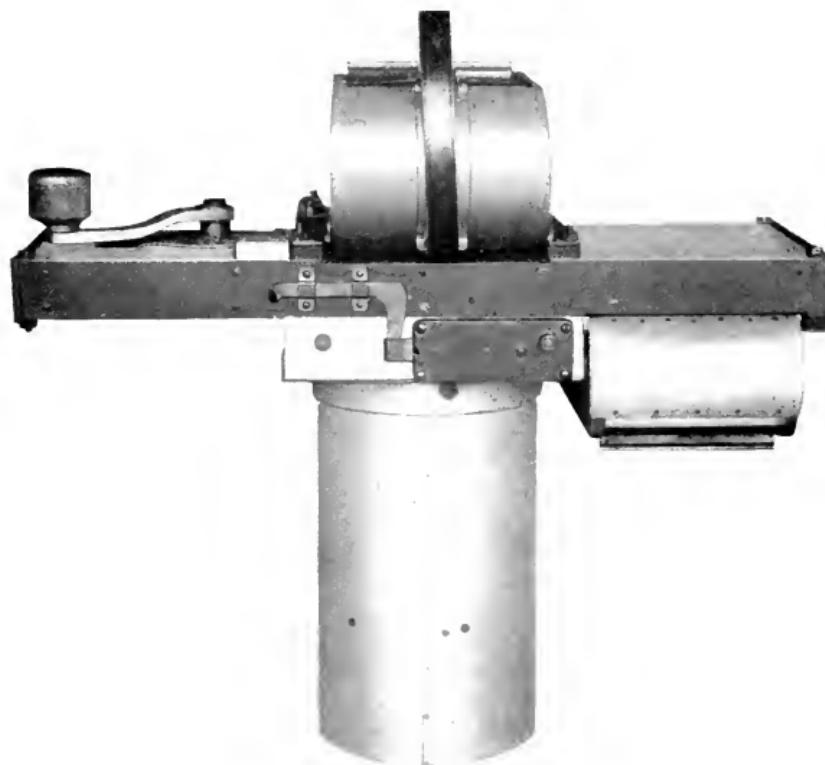


FIG. 1

THE Kodak Companies figured prominently in the industrial mobilization that followed the outbreak of the World War and because of their highly-trained personnel and elaborate manufacturing equipment were asked to make such widely diversified products as a special fire-proof varnish for aeroplane wings, aeroplane machine-gun sights, trench periscopes, special tripods for engineering corps and eye-

pieces for gas masks. The Kodak Research Laboratory, moreover did important work on a special instrument for determining the value of camouflage systems and in aerial photographic experiments. But it is in the development of special aviation cameras that the Kodak Companies have excelled particularly and it is the purpose of this article to dwell especially upon this feature of its war endeavor.

It has become a common saying that aeroplanes are the "eyes" of a modern army, but this appellation would not be so widely quoted were it not for the steady, faithful service of aerial cameras which penetrate mists through which the human eye cannot see and accurately record that which the fallible airman's memory will not hold. Photography, therefore, has played a very big role in this war and without it numerous clever stratagems and the quick stoppage of many a well-planned offensive would not have been possible. It has, in fact, given the General of every army that greater security and confidence which any one in defensive or offensive work would obtain by accurate records of the other fellow's position and operations as shown in frequently repeated photographs of the areas in which the opposing forces are working.

The aero cameras produced by the Kodak Company may be divided into two groups, one including several types of hand-held cameras for oblique pictures and the other those attached to the fuselage of the aeroplanes for vertical pictures used in photographic mapping. To these may be added an ingenious gun camera (described in the September KODAKERY) which may be mounted on a Lewis Machine Gun in place of the ammunition magazine and which gives the fighting airman the necessary target practice, obtainable in no other way, exposures being made on a motion picture film instead of firing actual bullets.

Back in 1915, the first Eastman Aero Camera of the hand-held type was developed. At that time little

information was available regarding the special requirements of aerial photography and considering what obstacles they had to overcome, the designers of this first camera, the F. & S. Aero Camera Model A, as it is called, turned out a very creditable instrument. This camera was quickly followed by improved models of the same type.

After the United States entered the war, experts from the Eastman Kodak Company were called into consultation with the military and naval authorities at Washington and Langley Field and, with the assistance of trained photographic men from the allies, plans were laid for the construction of new aerial cameras embodying all the latest requirements in large quantities commensurate with the enormous aeroplane construction program promulgated in the United States at the time. Intensive experiments and field trials to determine the exact type of material best adapted for the purpose were immediately in order. A large part of the Eastman technical staff, and a good part of the manufacturing space of several of its plants, was at once devoted to the development of the new war equipment. In spite of the obstacles caused by shortages in materials and the many new problems encountered, great success was speedily realized in the design and construction of serviceable aero cameras for the various purposes desired.

Prior to the war, most of the high-grade optical glass used on this continent came from France and Germany. A new source of supply had to be at once created for the production of the large

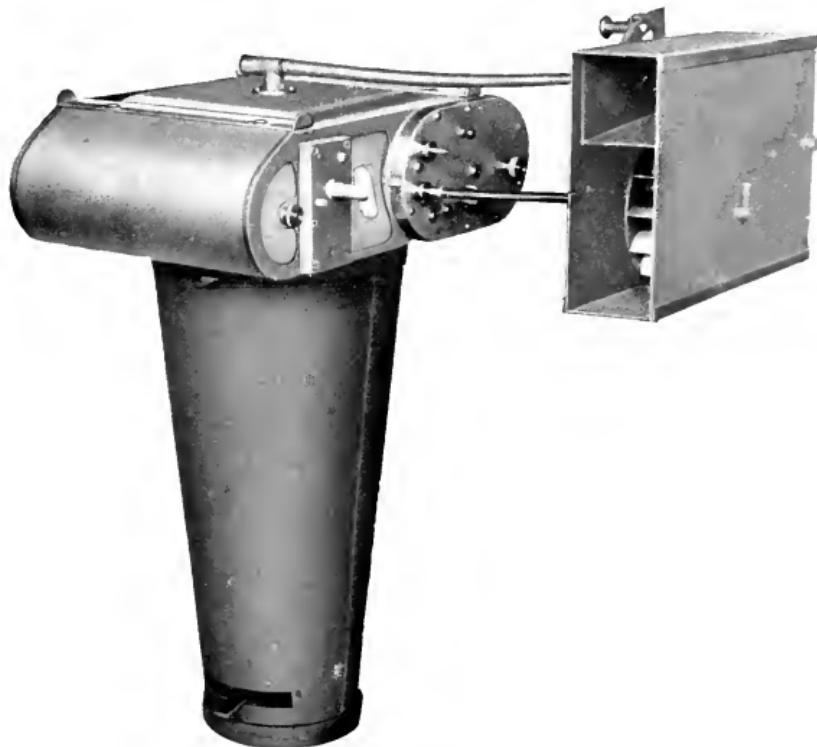


FIG. 2

number of aero camera lenses required. Realizing the critical nature of the situation the lens designers of the Kodak Company were at work early on the design of aerial lenses for high-speed operation, while representatives in Europe looked into the glass situation. Excellent co-operation was obtained from the Geophysical Laboratory at Washington, and from several prominent American manufacturers of glass, and as a result, within the short period of twelve months, a new industry for making optical glass in quantities to satisfy the enormous military

demands was created. Moreover, in the development and perfection of the Hawk-Eye Aerial Lens, the engineers of the Hawk-Eye works of the Eastman Kodak Company attained one of the big triumphs of the war.

In the design of the Hawk-Eye Aerial Lens, small covering power and highest definition and speed were required. The first Hawk-Eye Aerial Lens was of 10 inches focal length designed to work at *f*.4.5 and to cover a 4-inch by 5-inch plate, and proved very successful. Hawk-Eye lenses of other focal lengths, of which the 48-inch

lens is particularly worthy of mention, were subsequently produced. These lenses, designed under the stress of war conditions, represent the very best in the way of optical performance.

The 48-inch Hawk-Eye lens works at $f.8.8$ with a plate about 7×9 inches in size, and is believed to be the first one of its size and type designed especially for aerial work. It is, in fact, the long-range "gun" of the aerial photographer's battery. With this wonderful lens it is possible to get photographs from the highest altitudes showing objects on the earth with almost microscopic detail. The lens is mounted in a special camera five feet long, which is fitted into a plane especially designed for the purpose.

Owing to the persistence of the anti-aircraft guns, or "Archies," as they are slangily called, photographs in the war zone must usually be taken at heights of 10,000 feet or more. For photographic mapping and operation at these heights the Eastman Model C-2 (Fig. 1), and Model K-1 (Fig. 2), Aero Cameras, are particularly worthy of mention, the C-2 being designed for use with plates and

the K-1, which is entirely automatic in action, for use with films.

The C-2 (plate) Aero Camera is hand-operated and mounted in the floor or on the outside of a one or two-passenger aircraft. It is of aluminum construction throughout. Two metal magazines, with a capacity of 24 plates, 4×5 inches in size, are provided, the plates being fed by gravity to the recording plane. Exposures are made by a slight pull of the forefinger upon the shutter release lever. Shutter speeds range from 1-120 to 1-435 second. This camera is fitted with a Hawk-Eye Aerial Lens with an equivalent focus of $8\frac{1}{2}$ inches, having a fixed aperture of $f.4.5$, in adjustable standard mount. The total weight of the camera, including lens and two magazines, is 21 pounds. Flying at definite altitudes, so that the negatives procured are made to scale, it is easily possible to fit prints or enlargements together with remarkable accuracy and thus produce photographic maps or mosaics of long strips or wide areas of territory.

The K-1 (film) Aero Camera is one of the most ingenious cameras ever produced. It is entirely automatic in action, being operated by

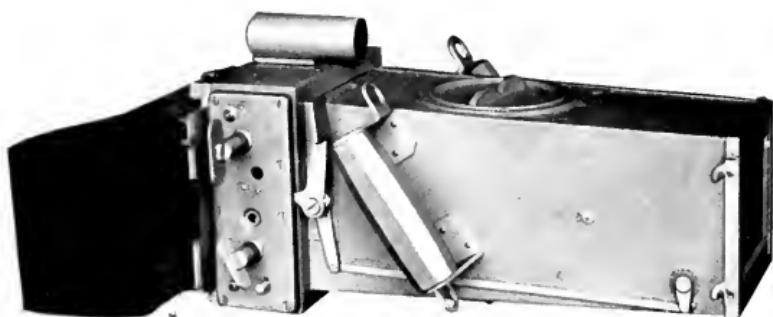


FIG. 3

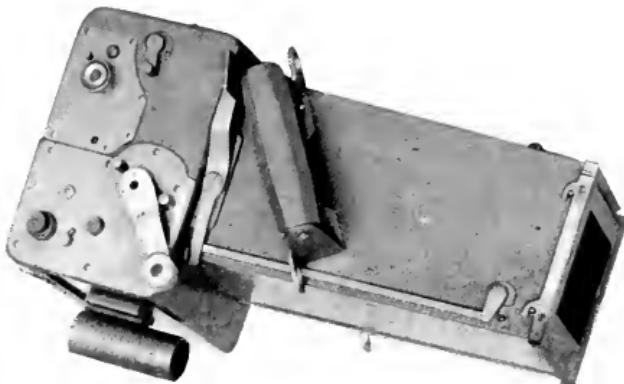


FIG. 4

a special wind motor. Mounted in his single-seater plane, the pilot need only start the operation of the wind motor by means of a lever, and then one or as many exposures as are within the limitations of the roll of film may be made at will. The roll of film is $9\frac{1}{2}$ inches wide by 75 feet long, sufficient for 100 exposures. The Hawk-Eye Aerial Lens is of 20-inch focus, f.6, and is provided with an adjustable device for carrying compensating filters directly in front of the lens. In the development of a film aerial camera of this type the vibration of the machine presented an obstacle that seemed almost insurmountable. The scheme of holding the film firmly in the recording plane by constant vacuum suction produced by a Venturi tube finally solved the problem. The time between exposures can be regulated by a damper control mechanism for the wind motor. When the wind motor is started, exposures are made at predetermined fixed intervals to suit the photographic requirements. Flying

at a height of 10,000 feet, an area two square miles in size can be photographed with the K-1 Camera *at each exposure*.

In spite of the fact that most of the routine photographic work in the war zones is done at high altitudes, there are times, however, when lower flying is done, and for this purpose a light-weight, easily operated hand-held camera is desired. For this purpose the Kodak Company has developed the Model A-1 (Fig. 3) for use with plates and the Model B-1 (Fig. 4) for use with films. The shutter release on these models is so located as to be easily operated by the observer's right thumb. As a protection against exposure of the lens to fog, mist or dirt, use is made of a safety shutter in front of the lens. A direct vision tubular finder, having intersecting vertical and horizontal wires, provides proper sighting facilities. Both cameras are fitted with 10-inch Hawk-Eye Aerial Lenses and Graflex Focal Plane Shutters. With the B-1 Camera daylight loading also can be accomplished.

Looking toward the peace-time development of aviation, these hand-held cameras, Models A-1 and B-1, make a strong appeal to the civilian aviator. Today photography occupies a large place in the affairs of every one of us, and these two cameras broaden the

scope of photography so as to include the realm of air. The C-2 and K-1 mapping cameras will also be available for making peace-time photographic maps in place of ordinary survey maps and for photographic progress and valuation reports.



COMIN' THROUGH THE RYE

Made with a Kodak

AUTUMN COLORS

The woods at this season present to our eye nearly the whole range of colors to be found in the spectrum with the exception, possibly, of blue and violet; we have some of the deepest and most gorgeous shades of red intermingled with browns of every description and numberless examples of yellow and green.

The inexorable march of the seasons provides us with many interesting changes in the face of nature which we wish to record with the Kodak, but surely none

so replete with color as the woodland scenes which are to be seen at this time of the year.

To obtain the proper monochrome values for these colors we must give sufficient exposure or the preponderance of reds and yellows will not have time to record themselves. More satisfactory results will, however, be obtained by using a Kodak Color Filter, and giving ten times the normal exposure, supporting the camera rigidly, of course, to prevent movement.



IN A PYRENNES VILLAGE
Made with a Kodak

LITTLE PEOPLE

FRIENDLY REPORTS
BY THE KODAK





THE FUNDAMENTALS OF PHOTOGRAPHY

The concluding article in Dr. C. E. K. Mees' interesting and highly successful series on "The Fundamentals of Photography," will appear in the November issue of KODAKERY.



LET THE KODAK WRITE THE LETTER

BY PHILIP MONTROSE

ENTHUSIASM over letter-writing is one of the many things that has been entirely left out of my system. And so general is this failing that I suspect that not only has it been left out of my system but the solar as well. Letters to the cousins out west or to Brother Ed in Nova Scotia, or to the folks back home, while they are highly necessary, never fill our

cup of happiness to overflowing, as one of our better poets so aptly puts it. It's nice to get letters—but most of us would rather do something else than write them. And if we don't write them, we won't get them. There you are.

Some months ago, an advertising phrase caught my eye. It went like this: "Let Kodak tell the story." And as I read it the



THE GENTLE READER
Made with a 3-A Folding Kodak



A CORNFIELD CONFIDENCE

Made with a Premo

thought came to me—"Let Kodak write the letter." Pictures of the new baby, occasional pictures of the children, pictures of our new home—such pictures are obvious and we usually send them on to people who, we feel, are most interested in us. We know that mere words are inadequate on such special occasions; but mere words

are always inadequate and mere words are hard to write and take a lot of valuable time.

Why not let Kodak write the letter? Unless you are unusually gifted and have plenty of time at your disposal, your letter falls short of the mark in any event. Let pictures finish the story that words only begin.



WHEN THE SUN STEALS THROUGH

Made with 3A Folding Kodak. 1 sec. exposure; stop, f. 22.

You write, "We've built a new porch on the side of the house and it's a great improvement." Cousin Jennie reads this and is able to successfully conceal any evidences of undue excitement. After a few seconds, in fact, the letter goes into the waste basket. You write, "I'm sending you a picture of the new porch we've built." Cousin Jennie's interest is aroused at once and she looks at the picture. She sees Cousin Edna comfortably sitting in the porch hammock and little Eddie playing with his blocks on the steps. She recalls that she sent him those blocks. She sees that the porch is a distinct improvement and that it makes the house look considerably less like a police station and considerably more like a home. She sees that Ed senior has bought some new porch furniture.

The picture chats with her.

You write, "I've started a garden and for an amateur I don't think that I am so bad." That doesn't mean much. But you have enclosed a picture of your new garden and that means a great deal. Cousin Jennie sees that, as you have implied, you have a pretty pretentious looking garden. She notices that your tomatoes seem to be doing very well and that your pea vines are higher than the ones in her own yard. She sees that you have corn planted and she wonders whether you won't have a corn roast when she visits you in the fall. She notes that you have cut down the apple tree that retired from active business years ago. The picture chats with her.

She looks at these pictures a long time and then she takes them over to Nellie and she looks at them and when Harry comes home he will



A TWILIGHT SILHOUETTE
Made on the Lake Geneva

look at them. Later Cousin Jennie will look at them again.

Cousin Jennie was a very poor correspondent. She seemed to shun the interesting and her letter was usually confined to a description of the weather and the statement that everybody was well. But Cousin Jennie's Kodak is like anybody else's Kodak, and in a few days you see with your own eyes the stunning new car

Jim has bought; you see that little Clara is old enough to ride a velocipede and that Jim has five "hands" on the farm now and that the new barn is a really handsome structure; you see that Cousin Jennie's own garden is nothing to sneer at. Cousin Jennie may be a poor correspondent, but her Kodak has a nose for news—everybody's has.

Let Kodak write the letter.



WASHING FILMS IN LAKES AND PONDS

AN EMERGENCY METHOD

THE weather was extremely sultry during our stay at the lake a few summers ago; in fact the humidity was so great that our clothing, which was damp at bed time, still felt damp next morning.

We had exposed a roll of film and, knowing the injurious effect which hot, moist air has on all sensitized photographic products with which it comes in contact—and in sultry weather this kind of air does come in contact with the section of film that lies in the focal plane inside the camera—we decided to develop the roll at once, if the necessary equipment could be found.

Our hosts had a Kodak Film Tank and a small fixing tray, together with the necessary chemical preparations, but they had nothing that we cared to use for a washing tray, so we concluded to take a chance on washing the films in the lake.

This was three years ago and as

all these films are still in perfect condition, those who sometimes find themselves in a similar predicament may be interested in the method we employed.

The roll of film was developed in the evening and after it was taken from the fixing bath a film clip was attached to each end of the roll. One of these clips was tied to one end of a board about five feet long and an anchor rope, with stone attached, was tied to the other end. This device was then put out in the lake where the water was about ten feet deep. The clip on the free end of the roll served as a weight which kept the film hanging straight downward in the water.

As the lake was large and deep and the water was cool the film was left in the water all night. This was not necessary, as 45 minutes of this kind of washing is ample, but we wished to see if the fishes or the turtles would interfere with it. They did not touch it. You see it

contained no negatives of minnows, frogs or other items that usually appear in a piscatorial menu.

The only precaution we took was to place the film far out from shore in the clearest and best sheltered water we could find that was free from weeds, so as to guard against any sand being washed against it in case a wind should arise and stir things up.

While this method of washing films is thoroughly practical it is only recommended as an emergency measure, and when the method is employed, the following precautions should be carefully observed:

Always use a *fresh acid fixing bath* and leave the negatives in this bath half an hour or longer, moving them about in the bath occasionally so the bath will have free access to both the front and back of each negative.

The water in small lakes and ponds is pretty sure to be warm in July and August, and unless the gelatine coating on the film has been well hardened by thorough fixing in a fresh acid fixing bath it is apt to frill, that is, pucker up or leave its support, when left a long time in warm water.

If the thermometer used for testing the temperature of the developer shows that the water is warmer than 55 degrees do not wash the film for more than 10 minutes, then, after it is dry, it should be washed again, at home, for a full hour in running water, or in twelve changes at five minute intervals, in a tray. It takes longer to wash the chemicals out of films after they have once dried than immediately after they are taken from the fixing bath.

Should there be any sediment on the films when they are taken from the lake this can be removed by gently drawing them between the thumb and fingers, under water, and, should any dirt be left on them they will feel gritty when dry. This dirt can easily be removed at any time, but the only way to do it without injuring the films is to place them in clean water for half an hour before undertaking to clean them. Clean both sides of each film by placing it on a sheet of glass and gently swab it with a large tuft of absorbent cotton.

In the writer's opinion it is risky to wash films in the current of running streams, as most streams carry sediment and other forms of solid matter which will scratch the negatives, but if a quiet pool can be found it might be perfectly safe to place them in it for a few minutes, then dry them and give them a thorough washing after reaching home.

By the exercise of a little ingenuity films can be perfectly developed, fixed and washed under nearly all the conditions that confront us on our outings.



WHEN TO USE A TRIPOD

NEVER hold the camera in the hand when making a bulb or time exposure. If you do the picture will be blurred. Always place the camera on a tripod, or some other support that is perfectly rigid, whenever you make an exposure that is longer than 1-25 of a second.



Chapel near Beriau-Bac from the top of which the picture on the opposite page was taken.

A KODAK AT THE FRONT

BY CHARLES C. EATON

Illustrated by the Author

THE region where the Aisne River crossed the battle lines in the Champagne country was, perhaps, as well fought over

and as bloody an angle as any spot on the western front. There, at the town of Beriau-Bac, the little canal running along the bank of

the Aisne was joined at right angles by another canal running south through the city of Rheims to the Marne.

The Germans, in 1914, had taken up their post of defence, protected

on two sides by the angle of the canals, on a hill known to the French as Cote Cent-Huit (Hill 108).

To attack them the French had not only to cross the canals and



Picture produced by a two-hour exposure at night, showing the transit of star shells over German lines and No Man's Land as revealed by their illumination.

storm the hill, but for a mile or two before reaching the canal banks their operations had to be carried out in a low-lying field of sugar beets, where every trench and dugout was clearly visible to the enemy and open to his fire.

It was no wonder there was need for a dressing station for the many French soldiers that were wounded in this field. This "poste de secour," nature and the piety of the old French peasants had supplied. Once it had been only a curiously-shaped mound, the size of a small house and overgrown with trees. But many years ago the peasants had hollowed out a chamber in the soft earth of the mound, had faced it with brick and stone and built a chapel (shown on page 24), where the traveler might stop to rest and worship under the trees. And on the top they had placed an iron crucifix almost as tall as the trees themselves.

It was from between the trees, on the top of this mound, that a magnificent view of the battlefield could be obtained, but to make a daylight picture that would actually show military operations along the German lines two miles away was impossible, as the distance always appeared hazy and indistinct in the daytime.

But if such a picture could not be made by daylight might it not be possible to make it on a dark night, by the light of the star shells that were constantly lighting up the front during the hours of darkness? The thing was worth trying, at any rate, so the camera was set up on the mound, and at ten o'clock at night the shutter was opened and left open for two hours.

The star shells were flickering over the distant lines, sometimes falling on the ground so that for a moment the thin line of trees along the banks of the canal would stand out in clear relief, at other times mounting high into the air—fifty times as high as the trees—before they burst into light and fell in long, graceful curves on their silken parachutes. Now and then a string of colored beaded lights, intended as signals for the artillery, would drift upward and away and suddenly extinguish in mid-air.

There were moments when the scene was one of beauty and grandeur, but how much of this could be caught on the film of a Pocket Kodak?

A few days later the question was answered. The film was developed in a bomb-proof dugout darkroom, by the red light of an automobile tail lamp, and then eagerly printed, and there, on the print (page 25) was the record that the accumulated light of scores of star shells had impressed on the film.

An enlargement made from this film negative distinctly shows the wide field, the barbed wire, the trenches, the distant ribbon of an unused road, the poplar trees along the canal, the far-off crest held by the Germans, and even the star shells themselves, among which could be distinguished, by their different directions, the artillery signals intended for friend or foe.

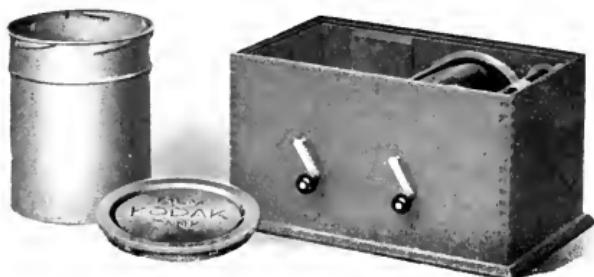
To one who is a true lover of the sport of amateur photography the Kodak has its victories no less in war than in peace.

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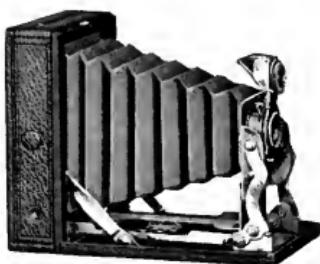
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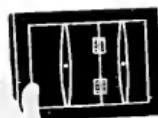
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The KODAK ANASTIGMATS

f.7.7 *f*.6.3 and *f*.4.5

THE time was when the photographer with a high grade lens used it on several different cameras. Perhaps it had a seven-inch length of focus and was used on a 4 x 5 plate at its full opening—say, *f*.6.3, and another time did duty as a wide angle on a 5 x 8 at *f*.16.

These were good lenses and cost a lot of money to make.

The Kodak Anastigmat lenses are made for a specific purpose. They cover the size for which they are listed as well, perhaps better, than any lenses made. But you can not stop them down and use them as wide angle lenses in a larger camera. They are not dual purpose lenses—that's why they cost less to make and why they sell for less.

On the cameras they are listed with, no other lens will give better results—if as good. And ninety-nine people out of a hundred never want to shift them—at least not to a larger camera.

Kodak Anastigmats sell for less because they can't do the things you don't care anything about having them do.

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